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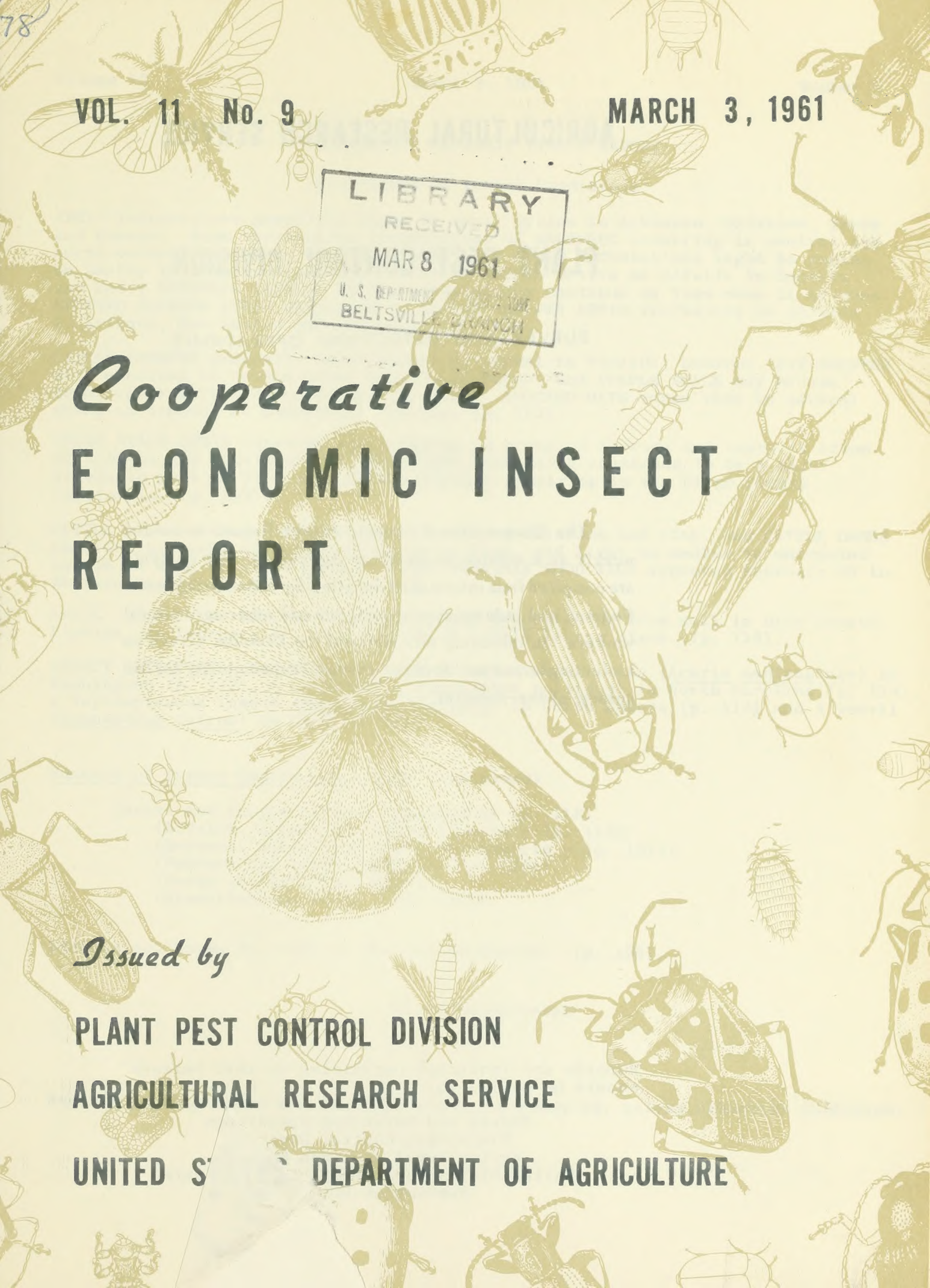

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Cooperative
ECONOMIC INSECT REPORT

Issued by

PLANT PEST CONTROL DIVISION
AGRICULTURAL RESEARCH SERVICE
UNITED STATES DEPARTMENT OF AGRICULTURE

AGRICULTURAL RESEARCH SERVICE

PLANT PEST CONTROL DIVISION

SURVEY AND DETECTION OPERATIONS

The Cooperative Economic Insect Report is issued weekly as a service to American Agriculture. Its contents are compiled from information supplied by cooperating State, Federal, and industrial entomologists and other agricultural workers. In releasing this material the Division serves as a clearing house and does not assume responsibility for accuracy of the material.

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Survey and Detection Operations
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Volume 11 March 3, 1961 Number 9

COOPERATIVE ECONOMIC INSECT REPORT

Highlights of Insect Conditions

APHID infestations generally light in small grains in Arkansas, Oklahoma, Texas and Kansas. Some threatening infestations of GREENBUG occurring in central and north central Oklahoma, however. CORN LEAF APHID infestations light to medium on barley in Arizona. (p. 111). ALFALFA WEEVIL active on alfalfa in Georgia and heavy EGYPTIAN ALFALFA WEEVIL infestations continue on Yuma-mesa in Arizona. SPOTTED ALFALFA APHID appearing in Kansas and PEA APHID increasing on alfalfa in Arizona, New Mexico and Oklahoma. (p. 112).

CITRUS INSECTS generally below normal or normal in Florida; however, SIX-SPOTTED MITE expected to become heavy locally in March, and PURPLE SCALE may become troublesome in scattered areas. (p. 112). AVOCADO MITE worse than in several years on avocado at Homestead, Florida. (p. 113).

GREEN PEACH APHID numerous and damaging in areas of Florida and heavy in areas of Arizona and California. A SERPENTINE LEAF MINER continues to be a major vegetable pest in Florida. TOMATO PSYLLID appearing in San Diego County, California. (p. 113).

CATTLE LICE continue troublesome in areas of Oklahoma and Utah; and CATTLE GRUBS numerous in backs of cattle in areas of Utah, and light to medium in untreated cattle in some Virginia herds. ROCKY MOUNTAIN WOOD TICK appeared February 20 in Whitman County, Washington. (p. 115).

Adult of a Cuban May beetle (*Phyllophaga bruneri*) dug from soil in Dade County, Florida, on February 21; some emergence likely taking place. (p. 116).

INSECT DETECTION: New State records reported were a mite (*Aceria medicaginis*) in Washington (p. 112), a cockroach (*Leurolestes pallidus*) in North Carolina (p. 114), a lepidopterous insect (*Epepaschia zelleri*) in North Dakota (p. 114) and a weevil (*Gymnaetron tetrum*) in Utah (p. 114).

Summary of Insect Conditions - 1960 (continued)

Cereal and Forage Insects (continued) (p. 118).
    (Alfalfa, Clover and Vetch Insects - (p. 118)).
    (Soybean, Peanut and Field Pea Insects - (p. 131)).
    (Pasture and Grass Insects - (p. 135)).
    (Pests of Flax - (p. 137))✓
    (Miscellaneous Pests - (p. 137)).

INSECTS not known to occur in the United States. (p. 139).

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Reports in this issue are for week ending February 24, unless otherwise indicated.

WEATHER OF THE WEEK ENDING FEBRUARY 27

Temperatures averaged above normal in most of the Nation for the third consecutive week. Considerable melting of snow and ice occurred in northern areas, where temperatures occasionally rose into the 50's and 60's and averaged 10° to 15° above normal for the week. Subzero minima were limited to a few extreme northern areas, and freezing did not occur in coastal areas, except those in New England.

Precipitation was moderate to heavy east of a line joining Detroit, Michigan, and Corpus Christi, Texas, and in the Pacific Northwest, and mostly light elsewhere. Rain fell on 5 to 7 days in the Southern States and resulted in damaging floods in Mississippi, Alabama and Georgia, where weekly totals ranged up to at least 17 inches. Birmingham, Alabama, measured almost 11 inches of rain in slighlty more than 3 days. One benefit of the heavy rains was the restoration of subsoil moisture in southeastern Georgia. Several tornadoes were reported in the South, one of which caused 8 injuries and heavy damage in Washington Parish, Louisiana, on the 23d. Precipitation along the north Pacific coast ranged up to more than 8 inches in Oregon, where monthly totals for February are approaching new records. Some flooding was reported in most rivers in the Puget Sound area and in the Olympic Peninsula.

Heavy snow fell in parts of the Southwest at the beginning of the period, with 10 to 20 inches measured west of Lubbock, Texas, on the 20th. Oklahoma reported a fall of 1 to 3 inches across the southern two-thirds of the State on the morning of the 24th. On the 25th, moderate to heavy snowfall over the Ohio Valley extended to southern Michigan and north-central Tennessee. Falls ranged up to 15 inches in south-central Indiana and 12 inches in Kentucky and Tennessee. In much of Indiana high winds blew the snow in drifts several feet high, and transportation was almost brought to a standstill. Much of this heavy snow melted during the next 2 days. Snowfall in the Far West increased depths slightly at some higher elevations, but the pack generally remained well below normal. (Summary supplied by U. S. Weather Bureau).

CEREAL AND FORAGE INSECTS

GREENBUG (Toxoptera graminum) - KANSAS - Counts less than one per linear foot of row in wheat and barley in southeastern and south central areas. (Peters, Feb. 17). OKLAHOMA - Infestations continued low in most small grain in south central, southwest and west central areas. Only a few fields have counts averaging up to 15-30 per linear foot. Infestations noted in a high percentage of fields in central and north central areas; counts per linear foot by county were 8-80 in Kingfisher, 10-60 in Garfield, 10 in Grant, 2-30 in Kay and western Osage, 10-30 in Major and 75 in one field in Blaine. Populations increased 50-60 percent from the previous week's counts in some fields checked in Kingfisher County. (Okla. Coop. Sur.). ARKANSAS - None found in last several weeks in northwest area. (Ark. Ins. Sur.). TEXAS - Populations very light to light in north central and south central counties. Heaviest infestations reported from east central areas near Bryan-College Station. (Chada). NEW MEXICO - No infestations found in Roosevelt County grain fields. (N. M. Coop. Rpt.).

ENGLISH GRAIN APHID (Macrosiphum granarium) - KANSAS - Counts in wheat fields in southeastern and south central areas averaged less than one per linear foot of row; 10 percent winged. (Peters, Feb. 17). OKLAHOMA- Continued common in small grain in western two-thirds of State, with highest counts, up to 100 per linear foot, found in west central area. (Okla. Coop. Sur.). ARKANSAS - Counts in small grain very low, less than one per linear foot in northwest area. (Ark. Ins. Sur.). TEXAS - Infestations building up in few south central counties where small grains making rank growth. Populations, however, classed as very light to light. (Chada).

APPLE GRAIN APHID (Rhopalosiphum fitchii) - OKLAHOMA - Infestations becoming increasingly more common in small grain throughout western two-thirds of State. Counts per square foot ranged 3-40 in south central, 10-75 in west central, 3-60 in central and 5-50 in north central area. (Okla. Coop. Sur.). TEXAS - Very light to light infestations appearing on rank small grain in south central area. (Chada).

CORN LEAF APHID (Rhopalosiphum maidis) - OKLAHOMA - Reported in only 2 fields of small grain in western two-thirds of State. Counts averaged 20 per square foot in Major County field and one per linear foot in Jefferson County field. (Okla. Coop. Sur.). ARIZONA - Infestations light to medium in barley statewide. (Ariz. Coop. Sur.).

WINTER GRAIN MITE (Penthaleus major) - OKLAHOMA - Light numbers present (5-70 per linear foot) in approximately one-half of fields surveyed in Blaine, Major, Kingfisher, Garfield, Grant, Kay and Osage Counties. Found in very limited numbers in few fields in west central area. (Okla. Coop. Sur.). TEXAS - Populations in all areas checked continue to decline, with heaviest infestations in north central and northeastern counties although considered light. (Chada, Newton).

CUTWORMS - OKLAHOMA - Several species present in limited numbers in fields of small grain in western two-thirds of State. (Okla. Coop. Sur.).

A CRANE FLY (Tipula sp., not simplex) - CALIFORNIA - A heavy infestation of larvae infesting a barley planting in Fruto, Glenn County. Some north coastal and inland counties have experienced severe outbreaks of Tipula simplex. Such outbreaks are periodic within the State. (Cal. Coop. Rpt.).

ALFALFA WEEVIL (Hypera postica) - OHIO - One adult collected September 6, 1960, in Belmont County by R. Seichriest. Det. by R. E. Warner. This is a new State record. The specimen was found during initial survey in Ohio River counties on September 6. On September 16, additional surveys made in same and adjacent fields with negative results. Other counties surveyed with negative results were Columbiana, Jefferson, Monroe, Washington, Athens and Meigs. There is some question at present if the infestation is established since the second survey was negative. (Holdsworth). GEORGIA - Light infestation on alfalfa in Fayette County (Varner) and eggs, larvae and adults present in alfalfa in Spalding County (Tippins).

EGYPTIAN ALFALFA WEEVIL (Hypera brunneipennis) - ARIZONA - Heavy infestations continue in many Yuma-mesa alfalfa fields. Light infestations present in Yuma and Gila Valleys and in central area. (Ariz. Coop. Sur.).

SPOTTED ALFALFA APHID (Therioaphis maculata) - KANSAS - Found only on one south sloping roadside embankment in Montgomery County, southeast area. All open alfalfa fields checked in southeastern and south central areas negative. Counts at Montgomery County location ranged 0-50 per plant. Nymphs, wingless adults and winged adults present. Honeydew present on heavier infested plants. (Peters, Feb. 17). TEXAS - Averaged 10-20 per sweep on Brazos and Burleson County alfalfa. (Newton). NEW MEXICO - Generally light infestations in alfalfa checked in Chaves County; none found in Roosevelt County. (N. M. Coop. Rpt.).

PEA APHID (Macrosiphum pisi) - ARIZONA - Infestations continue to increase in alfalfa in central and southwest areas. Populations medium in some fields. (Ariz. Coop. Sur.). NEW MEXICO - Building up in alfalfa in Chaves and Roosevelt Counties. Young stands showing some damage. (N. M. Coop. Rpt.). OKLAHOMA - Light, but gradually increasing, in alfalfa in western half of State. Counts now range up to 20 per linear foot of row. (Okla. Coop. Sur.). ARKANSAS - Counts lower than 2 weeks ago; only 1-3 per square foot in vetch in northwest area. (Ark. Ins. Sur.).

A MITE (Aceria medicaginis) - WASHINGTON - All stages found in leaf axils of alfalfa in Walla Walla area; a new State record. (Woodworth).

A CASEBEARER - GEORGIA - Light to moderate infestations of hibernacula on pecan trees in Lowndes County. (Johnson).

FRUIT INSECTS

Citrus Insect Situation in Florida - Mid-February - CITRUS RUST MITE (Phyllocoptruta oleivora) infested 67 percent of groves (norm 65 percent); 36 percent economic (norm 41 percent). Infestations will continue in average range. Increases and decreases will be noted, but the statewide status will change very little. Highest districts are Bartow, Ridge, Brooksville, west coast and Indian River. CITRUS RED MITE (Panonychus citri) infested 38 percent of groves (norm 62 percent); 13 percent economic (norm 32 percent). Infestations continue at a record low level and will remain low. No districts in high range, but a few scattered groves have sufficient mites to warrant treatment. TEXAS CITRUS MITE (Eutetranychus banksi) infested 22 percent of groves; 5 percent economic. Little trouble expected. SIX-SPOTTED MITE (Eotetranychus sexmaculatus) populations low but increasing. A few infestations expected to become heavy during March. FLORIDA RED SCALE (Chrysomphalus aonidum) infested 67 percent of groves (norm 47 percent); 6 percent economic (norm 6 percent). Infestations generally will hold at slightly below average level until late March. Highest districts are Indian River and Ridge. PURPLE SCALE (Lepidosaphes beckii) infested 79 percent of groves; 9 percent economic. A general increase in activity occurred recently which may lead to troublesome infestations in scattered areas. These are mostly likely to occur in Ridge, Orlando and Indian River districts. APHIDS may be expected to appear on new growth within next 2 weeks. (Simanton, Thompson, Johnson (Citrus Exp. Sta., Lake Alfred)).

CITRUS BLACKFLY (Aleurocanthus woglumi) - MEXICO - Surveys during January in the chemical and free zones in the states of Tamaulipas, Nuevo Leon, Sonora and Baja California were conducted on 162,902 trees on 2,309 properties. One infestation consisting of 12 trees found near Allende, Nuevo Leon. Treatments continued in Municipio Allende, Nuevo Leon. (PPC, Mex. Reg.).

MEXICAN FRUIT FLY (Anastrepha ludens) - TEXAS - First specimen of season, a male, trapped on December 19 in Hidalgo County. During January, trap inspections revealed the following collections: One A. ludens, 7 A. serpentina, 2 A. fraterculus, 1 A. monbinpraeoptans and 2 A. spatulata. (PPC, So. Reg.).

PURPLE SCALE (Lepidosaphes beckii) - CALIFORNIA - Light infestation on orange in Montecito, Santa Barbara County. (Cal. Coop. Rpt.).

AVOCADO RED MITE (Oligonychus yothersi) - FLORIDA - Worse than in several years on avocado at Homestead, Dade County. (Wolfenbarger).

SAN JOSE SCALE (Aspidiotus perniciosus) - CALIFORNIA - Heavy infestation on dooryard apple trees in Fort Jones, Siskiyou County. (Cal. Coop. Rpt.).

AN ARMORED SCALE (Clavaspis sp., close to C. pedilanthi) - TEXAS - Moderate to heavy local infestation on apple trees in Floyd County. Det. by McDaniel. Apparently a new species. (Lewis).

BLUEBERRY BUD MITE (Aceria vaccinii) - NORTH CAROLINA - Over 60 percent of twig in one planting infested in Bladen County. Treated in August and September with oil. Live mites found and extent of injury indicated they have been active during winter. (Harper, Farrier).

TRUCK CROP INSECTS

GREEN PEACH APHID (Myzus persicae) - FLORIDA - Extremely high in Homestead, Dade County, area averaging 100 plus per leaf on untreated potatoes. Winged forms beginning to appear.(Wolfenbarger). In Belle Glade, Palm Beach County, area, population low on celery, averaging one per 20 leaflets. (Harris). Numerous on cabbage in Bartow, Polk County, area; leaves of small plants severely scalloped, indicating previous heavy population. (J. C. Denmark). ARKANSAS - Common on green crops in upper Arkansas River Valley. (Ark. Ins. Sur.). ARIZONA - Heavy infestations present in Maricopa County sugar beets. Medium populations present in central and southwest area lettuce. (Ariz. Coop. Sur.). CALIFORNIA - Heavy, but spotty, infestations on tomatoes in Bonsall area, San Diego County. (Cal. Coop. Rpt.).

AN APHID - GEORGIA - Light to moderate infestations on mustard in Cook County. (Johnson).

A SERPENTINE LEAF MINER - FLORIDA - Continues a major vegetable pest. In Bradenton area, populations extremely heavy on tomatoes and about 50 percent of treated plants infested in test plots. As many as 5-6 adults could be found on single small plants. (Kelsheimer). At Belle Glade, populations continue high on celery and average 30-40 per leaflet. About 5 percent parasitized. (Harris). In Homestead area, infestations heavy on potatoes, averaging 80-90 per plant in untreated plantings. (Wolfenbarger). In Ft. Pierce area, adults seem to be declining but heavy deposition of eggs on tomatoes now hatching with warm weather. (Hayslip).

TOMATO PSYLLID (Paratrioza cockerelli) - CALIFORNIA - Heavy, but spotty, infestations on tomatoes in Bonsall area, San Diego County. (Cal. Coop. Rpt.).

ONION BULB FLY (Eumerus strigatus) - CALIFORNIA - Light infestation in sweetpotato in Rubidoux, Riverside County. (Cal. Coop. Rpt.).

CUTWORMS - FLORIDA - Appear heavy on cabbage at Gainesville, Alachua County, averaging 2 per plant. (Kuitert). IDAHO - Cutworms, probably Chorizagrotis auxiliaris, quite numerous on beets left in the field for seed; numbers ranged 2-20 per beet. (Scott).

YELLOW-STRIPED ARMYWORM (Prodenia ornithogalli) - TEXAS - Heavy, widespread infestations attacking spinach in Hidalgo County. (Deer).

CABBAGE LOOPER (Trichoplusia ni) - ARIZONA - Light larval infestations present in few central area lettuce fields. (Ariz. Coop. Sur.).

WHEAT CURL MITE (Aceria tulipae) - CALIFORNIA - Heavy infestation on garlic cloves in Rialto, San Bernardino County. (Cal. Coop. Rpt.).

MOLE CRICKETS (Scapteriscus spp.) - FLORIDA - Appearing in Ft. Pierce area with small numbers seen attracted to lights, but not a serious pest yet. (Hayslip).

TOBACCO INSECTS

VEGETABLE WEEVIL (Listroderes costirostris obliquus) - GEORGIA - Light infestations on tobacco in the plant bed in Tift, Berrien, Cook, Lowndes, Brooks and Thomas Counties. (Johnson).

TOBACCO FLEA BEETLE (Epitrix hirtipennis) - GEORGIA - Light infestations on tobacco in the plant bed in Thomas County. (Johnson).

COTTON INSECTS

BOLL WEEVIL (Anthonomus grandis) - TEXAS - Three overwintering adults found in an inspection of 425 bolls from 17 fields in Bee County. (Texas Coop. Rpt., Edgar).

PINK BOLLWORM (Pectinophora gossypiella) - TEXAS - An inspection of 425 bolls from 17 fields in Bee County revealed 58 live overwintering larvae. (Texas Coop. Rpt., Edgar).

FOREST, ORNAMENTAL AND SHADE TREE INSECTS

ENGRAVER BEETLES (Ips spp.)-CALIFORNIA - Serious outbreaks occurring in Glencoe and adjacent areas of Calaveras County. Infestations of bark beetles in ponderosa pine on land management ownership has reached epidemic status in Calaveras County, probably due to mild, dry winter. (P. A. Bougeois).

APHIDS - CALIFORNIA - Medium infestation of Essigella sp., probably californica, nymphs occurring on Pinus sp. and Cinara sp. heavy on juniper in Encinitas, San Diego County. (Cal. Coop. Rpt.).

A WEEVIL (Gymnaetron tetrum) - UTAH - Found during December 1960 heavily infesting moth mullein (Verbascum blattaria) purchased from a nursery at Logan by H. F. Thornley. The infested moth mullein originated in another state, and following the determination of G. tetrum by R. E. Warner, all of the plants and infested seed pods were destroyed. This was a new record for the State; however, at present no established infestation of the species is known to exist in Utah. (Knowlton).

A WEEVIL (Brachyrhinus cribricollis) - CALIFORNIA - Light infestation in dahlia bulbs in Port Hueneme, Ventura County. (Cal. Coop. Rpt.).

POTATO APHID (Macrosiphum euphorbiae) - CALIFORNIA - Heavy infestation on star-jasmine in Cardiff, San Diego County. (Cal. Coop. Rpt.).

A SCALE INSECT (Comstockiella sabalis) - CALIFORNIA - Heavy infestation on fanpalm (Livistona sp.) in Montecito, Santa Barbara County. (Cal. Coop. Rpt.).

SOUTHERN SPIDER MITE (Oligonychus ilicis) - CALIFORNIA - Light adult population on camellia in Arcadia, Los Angeles County, and heavy adult population on azalia in a nursery in San Diego, San Diego County. (Cal. Coop. Rpt.).

A SPIDER MITE (Oligonychus coniferarum) - CALIFORNIA - Heavy populations on Italian cypress in a nursery property in San Fernando, Los Angeles County. (Cal. Coop. Rpt.).

CITRUS RED MITE (Panonychus citri) - CALIFORNIA - Medium infestation of adults on Carolina cherry in Anaheim, Orange County. (Cal. Coop. Rpt.).

CITRUS FLAT MITE (Brevipalpus lewisi) - CALIFORNIA - Light adult infestation on privet in Yucaipa and Colton, San Bernardino County. (Cal. Coop. Rpt.).

INSECTS AFFECTING MAN AND ANIMALS

CATTLE LICE - OKLAHOMA - Moderate to heavy infestations of several species continued on cattle in all areas of State. (Okla. Coop. Sur.). UTAH - Severe in many Duchesne and Uintah County herds and sometimes severe in Holden-Kanosh area of Millard County where many herds have been treated. Also severe in Loa-Bicknell area of Wayne County where only 100 cattle have been treated. (Knowlton, Rickenbach).

HOG LOUSE (Haematopinus suis) - OKLAHOMA - Moderate to heavy numbers continued common on untreated hogs in eastern two-thirds of State. (Okla. Coop. Sur.).

CATTLE GRUBS (Hypoderma spp.) - VIRGINIA - Average per animal in untreated cattle was 6 in Montgomery County herd; 13 in a Glade Spring, Washington County, herd; 14 in an Appomattox, Appomattox County, herd. Animals treated with systemic insecticides averaged less than one per animal in each of the herds listed. (Turner). OKLAHOMA - H. lineatum numbers decreasing in cattle checked in most areas of State. (Okla. Coop. Sur.). UTAH - Numerous in backs of cattle at Altamont and elsewhere in Duchesne County, and in Loa-Bicknell area of Wayne County. Grubs have been evident for few weeks in backs of cattle in Holden-Kanosh area of Millard County. (Knowlton, Rickenbach).

STABLE FLY (Stomoxys calcitrans) - OKLAHOMA - Infesting cattle in localized areas of Choctaw County during week of February 18. (Okla. Coop. Sur.).

MOSQUITOES - OKLAHOMA - Adults of Psorophora sp. active in Stillwater area. (Okla. Coop. Sur.).

STICKTIGHT FLEA (Echidnophaga gallinacea) - CALIFORNIA - Light infestation on a dog in Escondido, San Diego County. (Cal. Coop. Rpt.).

SOUTHERN CATTLE TICK (Boophilus microplus) - FLORIDA - A total of 65,482 horses and mules were either dipped, sprayed or inspected during January for the eradication program. No ticks were found. (Div. Animal Industry).

ROCKY MOUNTAIN WOOD TICK (Dermacentor andersoni) - WASHINGTON - Found in Steptoe Canyon, Whitman County, on February 20; earliest known activity record for this species in area. (Weiss, James).

BROWN DOG TICK (Rhipicephalus sanguineus) - WASHINGTON - An engorged female was collected in Spokane on January 20. This is a rare occurrence in the State. (James).

DOG FOLLICLE MITE (Demodex canis) - NORTH CAROLINA - Four cases reported to the State Veterinarian in January. (Zweigart).

BENEFICIAL INSECTS

LADY BEETLES - NEW MEXICO - Adults of unspecified species very common in Roosevelt County alfalfa. (N. M. Coop. Rpt.). OKLAHOMA - *Hippodamia convergens* light, occasional to 0.5 per linear foot, in few fields of small grain in several areas of State. (Okla. Coop. Sur.). KANSAS - *H. convergens* larvae and adults present and active on alfalfa heavily infested with spotted alfalfa aphid in Montgomery County. Counts ranged 0-2 beetles or larvae per plant. (Peters, Feb. 17).

NABIDS (*Nabis* spp.) - OKLAHOMA - Light, up to 0.2 per linear foot, in small percentage of small grain fields in western two-thirds of State. (Okla. Coop. Sur.).

LACEWINGS (*Chrysopa* spp.) - OKLAHOMA - Adults common in Stillwater area; present in small percentage of small grain fields in western two-thirds of State. (Okla. Coop. Sur.).

MISCELLANEOUS INSECTS

A CUBAN MAY BEETLE (*Phyllophaga bruneri*) - FLORIDA - A single teneral adult dug from soil near Orchid Ranch, Miami, Dade County, on February 21. This is first time adults have been found in February and apparently some emergence now taking place. First adults found in 1960 on April 21. Since adults were found late in December and now in February, it seems likely some adults can be found throughout the year. (Fla. Coop. Sur.).

A SPOTTED CUCUMBER BEETLE (*Diabrotica undecimpunctata tenella*) - NEW MEXICO - Adults, which have overwintered in debris and lawns, becoming active throughout Dona Ana County. (N. M. Coop. Rpt.).

A LEAFHOPPER (*Keonolla confluens*) - WASHINGTON - Large numbers of adults entering houses and causing annoyance in Yakima and Toppenish area, February 1-12. Det. by P. W. Oman. (Landis).

MONARCH BUTTERFLY (*Danaus plexippus*) - IDAHO - First specimen of season seen in a peach orchard near Parma. (Scott).

A LEPIDOPTEROUS LARVA (*Epepaschia zelleri*) - NORTH DAKOTA - Specimens observed skeletonizing poisonivy in sandhills of Ransom County during August 1960. Det. by H. W. Capps. This is a new State record. (N. D. Ins. Sur.).

FALL WEBWORM (*Hyphantria cunea*) - NEW MEXICO - Overwintering pupae abundant around foundations of homes in Las Cruces area, Dona Ana County. (N. M. Coop. Rpt.).

A COCKROACH (*Leurolestes pallidus*) - NORTH CAROLINA - Taken in a house in Forsyth County on June 1, 1960, in both adult and nymphal stages. A new record for the State. Det. by A. B. Gurney. (Wright).

BROWN-BANDED COCKROACH (*Supella supellectilium*) - UTAH - Difficult to eliminate from a home at Vernal, Uintah County. (Knowlton). MARYLAND - Troublesome in home at Catonsville, Baltimore County. (U. Md., Ent. Dept.).

EASTERN SUBTERRANEAN TERMITE (*Reticulitermes flavipes*) - MARYLAND - Winged forms noted in a home at Baltimore. (U. Md., Ent. Dept.).

LIGHT TRAP COLLECTIONS

	Pseudaletia unipuncta	Agrotis ipsilon	Feltia subterr.	Peridroma saucia	Prodenia ornith.	Helio. zea
ARIZONA						
Mesa 2/13-19				2		
FLORIDA						
Quincy 2/16			8			
Monticello 2/21			8			
SOUTH CAROLINA						
Charleston 2/6-12		1	1			
Charleston 2/13-19	7	14	35		3	
TEXAS						
Brownsville 2/2-17	3	5	17			2

Summary of Insect Conditions - 1960

(Cont. from page 107)

CEREAL AND FORAGE INSECTS (Cont.)

Alfalfa, Clover and Vetch Insects: Several lepidopterous species caused varying degrees of damage to alfalfa, clover and vetch crops during the 1960 season, with infestation and damage varying with the species involved and the area in which infestation occurred.

ALFALFA CATERPILLAR (Colias eurytheme) populations were the heaviest in NEVADA since 1955, but damage was light except in Humboldt County where alfalfa seed fields were severely damaged in July. The pest was general in UTAH with little crop injury, but caused some damage to second-cutting alfalfa in COLORADO. In NEW MEXICO, larvae of alfalfa caterpillar averaged 1-5 per sweep in alfalfa in De Baca, Chaves and Eddy Counties during September, with damage being very noticeable. Buildup of alfalfa caterpillar was late in ARIZONA, larvae reaching 1-3 per 10 sweeps in mid-August. A gradual increase followed, extending into September, but generally damage was light compared with previous years. Heavy populations of alfalfa caterpillar developed during July in Yolo County, CALIFORNIA, and in other alfalfa-growing areas of the State during August, continuing active until December.

Alfalfa caterpillar caused limited damage to forage crops in OKLAHOMA during 1960 and light populations continued from May through September in NEBRASKA, with adult activity occurring in late September. Larvae averaged 3-6 per 10 sweeps. Adults of alfalfa caterpillar were numerous in alfalfa in SOUTH DAKOTA from mid-May to first of August, with larvae first observed the last week of July and being abundant up to the first killing frost. Although alfalfa caterpillar larvae were found as early as the second week of April in DELAWARE, they were not present in appreciable numbers until mid-July on alfalfa. Highest populations of 2 per 10 sweeps occurred from mid-August to mid-September, but in most fields of alfalfa no extensive injury could be directly attributed to this species.

Heavy infestations of ALFALFA WEBWORM (Loxostege commixtalis) occurred on alfalfa in several fields in Sussex County, DELAWARE, and considerable injury to this crop resulted in a few untreated fields during August. While present on alfalfa in New Castle and Kent Counties, no serious injury was noted in these areas. Both alfalfa webworm and BEET WEBWORM (L. sticticalis) were damaging to third-cutting alfalfa and new seedings in COLORADO during 1960. Considerable damage was caused to alfalfa in Chaves County, NEW MEXICO, by what was probably beet webworm, with young stands being most severely damaged. Heavy infestations of beet webworm were reported in several western counties of SOUTH DAKOTA during June and July and populations were not as high in MINNESOTA as during 1959, although most alfalfa acreages in that State required treatment. GARDEN WEBWORM (L. similalis) was a problem in local areas of ARIZONA on alfalfa and also in a few fields of seedling alfalfa in eastern KANSAS during the fall of 1960. A few scattered infestations of garden webworm occurred over MISSOURI from late July to mid-August and some economic damage was observed in the south central area of that State, where counts were as high as 35 larvae per sweep. Loxostege sp. averaged 1-2 per sweep and caused damage to isolated fields of alfalfa in south central, southeast and east central areas of OKLAHOMA during June and July, as well as damaging a few isolated fields in the western half of the State during August and early September. Populations of Loxostege spp. increased in the western portion of NEBRASKA in early June, where a total of 13,428 moths was collected in the Scotts Bluff County light trap between May 26 and June 1.

CLOVER HAYWORM (Hypsopygia costalis) infested hay stacked in fields on a farm in Russell County, VIRGINIA, where several tons of hay have been ruined annually by this pest.

Several ARMYWORMS were damaging to forage crops across the Nation during 1960. Populations of WESTERN YELLOW-STRIPED ARMYWORM (Prodenia praefica) damaged all forage crops in central and northern parts of CALIFORNIA during 1960, with alfalfa and permanent pastures suffering the most damage, and the pest developed moderate to heavy infestations on alfalfa in Churchill, Humboldt, Lyon, Pershing and Washoe Counties, NEVADA, in July and light to moderate populations in these counties in September. In UTAH, western yellow-striped armyworm damaged a few fields of alfalfa and YELLOW-STRIPED ARMYWORM (P. ornithogalli) caused light damage to the same crop in local southern and south central areas of that State. Yellow-striped armyworm was also a problem on alfalfa in local areas of ARIZONA, as was BEET ARMYWORM (Spodoptera exigua). Beet armyworm occurred in heavy numbers on alfalfa in south central TEXAS and was of noneconomic importance in KANSAS during 1960. FALL ARMYWORM (Laphygma frugiperda) completely destroyed stands of fall-seeded alfalfa in a few fields in eastern KANSAS; and medium to heavy damage by this pest to alfalfa was common in all areas of OKLAHOMA during September and October. This was the heaviest, widespread damage noted in the past several years in the latter State. In DELAWARE, yellow-striped armyworm and fall armyworm caused light injury to alfalfa during 1960; and local infestations of fall armyworm occurred on alfalfa in VIRGINIA.

CUTWORMS caused some economic damage to alfalfa in several Western and Plains States, as well as in one Midwestern and 2 Southern States. VARIEGATED CUTWORM (Peridroma saucia) damaged alfalfa plantings in Benton County, OREGON, in mid-July. Also in Oregon, injury by BLACK CUTWORM (Agrotis ipsilon) necessitated the reseeding of one field of alfalfa near Fargo, Marion County, and control measures were required in an additional 40-acre field against this cutworm and larvae of western spotted cucumber beetle (Diabrotica undecimpunctata undecimpunctata). ARMY CUTWORM (Chorizagrotis auxiliaris) caused moderate damage to seedling alfalfa in Humboldt County, NEVADA, and various species of cutworms severely damaged several fields of alfalfa in west central counties of the State by preventing regrowth after cutting. Army cutworm damaged much less alfalfa than usual in UTAH during 1960, although there was an outbreak in Box Elder County, and variegated cutworm was locally damaging to the same crop in the State. Several species of cutworms were a problem on alfalfa in local areas of ARIZONA and variegated cutworm caused some damage to third cutting and new seedings of alfalfa in NEW MEXICO. Black cutworm and variegated cutworm caused some economic damage to vetch in TEXAS; and infestations of variegated cutworm in seeding white clover ranged light to very heavy in LOUISIANA the first of April. Larvae numbered as many as 16 per square foot in some Louisiana fields, but by the end of April populations had decreased to less than one per square foot. Light, scattered populations of variegated cutworm occurred in alfalfa in central and southwestern NEBRASKA and the pest caused a small amount of damage to alfalfa in south central and east central KANSAS during June. Black cutworm caused moderate damage in rather large areas of western and southeastern IOWA during 1960, but was much less than in 1959.

Various other NOCTUIDS were damaging to alfalfa, clover and other forage crops to some extent. Larvae of GREEN CLOVERWORM (Plathypena scabra) first occurred in alfalfa in Kent County, DELAWARE, in late May, gradually increasing in clover and alfalfa to injurious proportions by early July throughout the State. Larvae remained numerous to common in alfalfa throughout the period July through October, with noticeable feeding injury. Green cloverworm populations in MISSOURI were low throughout the growing season with no damage evident; were not of economic importance in KANSAS, but caused some economic damage to forage crops in OKLAHOMA during 1960. ALFALFA LOOPER (Autographa californica) caused light to moderate damage to red clover in Humboldt County, NEVADA, during June, but was low in UTAH and only locally important on alfalfa in CALIFORNIA. Local infestations of alfalfa looper also occurred in Chouteau County, MONTANA; and the pest was common in most areas of SOUTH DAKOTA, but populations remained low the entire year. As in 1959, larvae of CABBAGE LOOPER (*Trichoplusia ni*) were present in alfalfa in DELAWARE from early August to mid-October, with population levels remaining very low. Cabbage looper caused a limited amount of damage to forage crops in OKLAHOMA and FORAGE LOOPER (*Caenurgina erechtea*) was not of economic importance in KANSAS during 1960.

CORN EARWORM (*Heliothis zea*) larvae were present in alfalfa throughout the season in DELAWARE, with highest counts of 3 per 10 sweeps in New Castle County in late October. In KANSAS, corn earworm was present in alfalfa during the summer and fall, but caused little damage. Corn earworm populations over OKLAHOMA were generally lighter during 1960 than those that occurred during 1958 and 1959. Only light damage was noted in early alfalfa, but localized damaging infestations occurred in late-planted fields during September in the eastern half of the State. In LOUISIANA, corn earworm larvae averaged 9 per 25 sweeps on white and crimson clover during April and May.

Other lepidopterous pests which occurred locally were CLOVER HEAD CATERPILLAR (*Grapholitha interstinctana*) adults (5 per 10 sweeps) on alfalfa and clover in Cuming County, NEBRASKA, during late May; SALT-MARSH CATERPILLAR (*Estigmene acrea*) and a TORTRICID (*Platynota stultana*) on alfalfa in ARIZONA; also another TORTRICID (*Tortrix pallorana*) which caused seed injury to alfalfa in UTAH. Salt-marsh caterpillar was of general occurrence in CALIFORNIA, with alfalfa, beans and forage crops all being damaged.

Of the few species of APHIDS reported as infesting forage crops during the 1960 season, PEA APHID (*Macrosiphum pisi*) and SPOTTED ALFALFA APHID (*Therioaphis maculata*) were by far the most serious. Populations of both of these aphids during 1960 were higher in the western two-thirds of OKLAHOMA than during 1959. Pea aphid injury in UTAH was more extensive than that caused by spotted alfalfa aphid. Pea aphid populations were extremely high on alfalfa in MINNESOTA during July, seriously stunted first-cutting alfalfa over TENNESSEE and were the heaviest in several years on alfalfa in MARYLAND. Damage by spotted alfalfa aphid during mid-July was heavier in ARIZONA than any since 1956, while in UTAH this aphid caused the least amount of damage to alfalfa than has occurred since the State became infested in 1954.

Pea aphid proved to be a continuing pest of alfalfa and peas in CALIFORNIA during the entire 1960 season, with medium infestations being most common. Infestations in ARIZONA built up in early March and were heavy statewide by March 26. Populations continued high through the first half of April, but diseased pea aphids began to appear in all areas. Decline was rapid and populations were low statewide by May 1. Generally, pea aphid populations in Arizona were much lighter and decline earlier than in 1959. Pea aphid was generally light in NEW MEXICO, causing only minor damage throughout the State except in Chaves, Eddy and Lea Counties, where populations developed to levels requiring controls. Pea aphid populations in southeast WYOMING were too light to cause damage to first-cutting alfalfa; however, second cutting was damaged in some parts of that State, with controls being applied to many fields in the southeastern area; and some fields were damaged in COLORADO. Pea aphid substantially lowered forage alfalfa hay and seed production in several areas of UTAH during 1960. Many outbreaks developed during the spring and summer and some damage developed in the fall. Populations of pea aphid remained generally low on alfalfa statewide in NEVADA throughout the 1960 season, although some treatments were necessary in alfalfa seed fields. Peak populations occurred in Nevada from mid-June to mid-July. Pea aphid populations remained below economic numbers throughout OREGON until August, when control became necessary in Malheur County. Only in isolated spots of Jackson County did pea aphid become a serious problem in the western part of Oregon during 1960.

Extremely large numbers of pea aphid occurred on alfalfa and clover in LOUISIANA during mid-April but had practically disappeared by the end of the month, probably due to the many predators and parasites present in most fields. Heavy pea aphid infestations occurred on vetch in north central TEXAS and on alfalfa throughout the State. During 1960, pea aphid populations were higher in the western two-thirds of OKLAHOMA than during the 1959 season. Light infestations of less than 5 per square foot occurred in alfalfa throughout the State until April. At this time, pea aphid populations increased to the highest level noted during the past several years in Oklahoma, beginning in the south central area and spreading throughout the remainder of the State within 2 weeks. Controls were applied to many south central and central area fields in an attempt to save the first hay cutting. Pea aphid infestations reached peaks during early May, with 500-800 per sweep being common in most areas, then gradually decreased, finally disappearing from legumes in late July. Light numbers of pea aphid reappeared on alfalfa in south central Oklahoma in early October and continued light (0-2 per sweep) in all areas the remainder of 1960. The heavy spring infestations were the highest recorded in Oklahoma since the survey program was inaugurated in 1955. Pea aphid infestations in ARKANSAS were very heavy on clover and alfalfa during the spring of 1960 and caused stunting in many fields.

Pea aphid populations appeared in MISSOURI when new spring growth began on alfalfa in southwest and southeast areas. Counts ranged 0-100 per sweep in late March and early April, and were as high as 500 per sweep in the southeast by mid to late April. Counts ranged 100-600 per sweep in the southwest during early May, and from mid to late May, began to increase in central and northern areas, but did not reach the damaging numbers present in southern areas. In the latter part of May, pea aphid populations in the southern portion of Missouri declined due to disease, predators and parasites. Pea aphid built up to large numbers in the spring of 1960 in southeastern KANSAS; however, alfalfa was cut before damage could result. Pea aphid was not a problem in the State later in the season. Although most pea aphid infestations occurred on alfalfa in NEBRASKA during 1960, red clover and sweetclover had spotted counts. Buildup was about 2 months earlier than in 1959, with peak population occurring the first week of June and averaging 700 per 10 sweeps. The highest count was 1,100 per 10 sweeps in Lancaster County. With parasite buildup in mid-June, pea aphid populations leveled off in Nebraska, averaging 40 per 10 sweeps the remainder of the season. Pea aphid began appearing in fields of alfalfa in SOUTH DAKOTA about the first of May. Populations were moderate most of the season but very little damage was observed. High counts of sexual pea aphid adults were observed in southeast South Dakota in the fall of 1960.

Pea aphid populations were extremely high on alfalfa in MINNESOTA during July. In areas of drought, these high numbers contributed to poor yields of alfalfa and, generally, it was not economical to apply controls. Early cutting of alfalfa to reduce pea aphid damage appeared to give best results. Pea aphid averaged 2.3 per sweep in alfalfa in south central and southwestern WISCONSIN the first week of May, but increased over 10-fold in these areas by the end of the month. Generally, populations in alfalfa averaged 20-30 per sweep from late May to late August, fluctuating with cuttings. Pea aphid built up rapidly on alfalfa in extreme southern ILLINOIS, reaching 200 per sweep in some fields the week of April 17, while populations were low in other areas of the State. A fungus disease was prevalent, decreasing populations rapidly in alfalfa in the southern area by May 15. However, populations were increasing in other areas of Illinois, with disease and predators just appearing. Generally, no extremely heavy pea aphid populations occurred throughout 1960.

Pea aphid seriously stunted first-cutting alfalfa over TENNESSEE in 1960, damage being enhanced by an extremely dry spring and an epidemic of winter black stem fungus. Another fungus ultimately destroyed the aphid population almost overnight. Ordinarily, pea aphid causes no detectable damage to alfalfa in Tennessee. In NORTH CAROLINA, pea aphid averaged 80 per 200 half-sweeps on alfalfa 4-6 inches high on April 21 and as many as 3,000 per 100 half-sweeps at other locations 5 days later. Pea aphid was very prevalent in VIRGINIA from May to July, with numerous locally light to medium infestations reported on alfalfa. This was probably due to continued cool, wet weather in early May, making conditions favorable for the rapid buildup on alfalfa. Pea aphid populations on alfalfa were the heaviest in several years in MARYLAND, particularly during late April and early May, when counts of over 1,000 per sweep were common in many fields in all sections of the State. Populations were very heavy on clover and alfalfa over DELAWARE from late April to mid-May, but did not again build up to this proportion during the season except in one field of alfalfa in Kent County during early August. Damage to alfalfa in Delaware early in the 1960 season was severe, with extensive yellowing and wilting occurring. Pea aphid populations on alfalfa were lower than in previous seasons in CONNECTICUT, which was constant with aphid activity in general in all crop areas of the State; and infestations continued light on alfalfa in RHODE ISLAND throughout 1960.

Populations of spotted alfalfa aphid varied over CALIFORNIA during 1960, but were present all year. Parasites and predators were very active in controlling the aphid in most cases; however, occasionally buildup was rapid and chemical treatment was necessary for control. Infestations of spotted alfalfa aphid on alfalfa in ARIZONA peaked during April, July and October. The April peak was not heavy in the central area but caused considerable damage in Yuma and Graham Counties. Infestations were low or absent statewide in late April. The summer buildup of spotted alfalfa aphid began in Yuma County during mid-June and infestations had become heavy statewide by July 10. The peak occurred around mid-July, and by early August infestations were low statewide. Damage during this period was heavier in Arizona than any since 1956, with 50-75 percent damage common in fields of susceptible alfalfa varieties. Another peak occurred in late October but was not nearly as severe as during the same period in 1959, particularly in central and southeastern counties. In Yuma County, spotted alfalfa aphid infestations lasted much longer than usual, with medium populations still present in some fields of alfalfa during late November. The aphid was generally light on alfalfa in NEW MEXICO during 1960 except in southern counties where many fields required controls. Isolated infestations on seedling alfalfa in Dona Ana County were also treated.

Spotted alfalfa aphid caused some damage to third cutting and new seedings of alfalfa in COLORADO during the 1960 season. In UTAH, spotted alfalfa aphid caused the least amount of damage to alfalfa that has occurred since the State became infested in 1954. Damage was estimated at $75,000 during 1960. Damage for the previous 5 years was as follows: 1959 - $130,600; 1958 - $178,000; 1957 - $165,000; 1956 - $500,000; 1955 - $780,000. Infestations of the pest were low generally in NEVADA, but economic populations did occur on seed alfalfa in Clark County during midsummer and on alfalfa hay in late September in some northern counties. Spotted alfalfa aphid appeared in north central counties of OREGON in late summer as it has done since 1959. New infestations occurred in Malheur County on September 22 and in Jackson County on November 4. Only slight damage to alfalfa has occurred to date.

Spotted alfalfa aphid was medium to heavy on alfalfa in many areas of TEXAS. Populations were higher during 1960 in the western two-thirds of OKLAHOMA than during 1959. Infestations showed a decided increase in some older fields of alfalfa in Kingfisher and Garfield Counties early in January, reaching more than 1,000 per square foot in a few fields later in the month. Elsewhere, populations of the aphid continued light until mid-April when a general buildup began in the southwest, and by the first of May had reached damaging proportions throughout most of the western two-thirds of the State. Numbers decreased until mid-July when counts of 75-150 per sweep were common in fields in the area. Following widespread thunderstorms over most of Oklahoma in August, populations of spotted alfalfa aphid remained low (up to 10 per sweep) until late September when damaging infestations again blanketed the western two-thirds of the State, with counts ranging up to 150 per sweep common in many fields until late October. Economic infestations were present in only a limited number of fields during November and December, with generally up to 10 per sweep present in most areas.

There were reports from several areas indicating these to be the heaviest infestations in the State since 1956. This was particularly true along eastern limits of the outbreaks. In most other sections of Oklahoma, infestations were somewhat heavier than those noted during the past 2 years.

Damaging numbers of spotted alfalfa aphid did not appear in KANSAS until late summer during 1960 and damage was generally confined to a few fields of fall-seeded alfalfa. First spotted alfalfa aphid specimens of the 1960 season in NEBRASKA were found in Howard County on July 22. Economic numbers built up in 2 areas of the State. First, the latter half of September along the Republican River Valley from Franklin County west to Dundy County, with counts averaging 510 per 10 sweeps. The highest count was 1,760 per 10 sweeps in Franklin County. A late fall buildup of spotted alfalfa aphid occurred in Sherman, Greeley and Howard Counties the first week of November, reaching 2,250 per 10 sweeps in Greeley County, with sexual forms found laying eggs in all 3 counties. This is the first time sexual forms have been found in Nebraska. It is not known if the eggs will overwinter.

Spotted alfalfa aphid was first found during the 1960 season in southwestern and southeastern MISSOURI in mid-June. Infestations were confined to these 2 areas of the State until mid-September and populations were low, ranging 0.02-150 per sweep. By October 15, spotted alfalfa aphid had moved to central and west central areas of the State and had also moved 50-75 miles north along the eastern border from the southeastern infestations. The only damage observed in Missouri was to a few fields of fall-seeded alfalfa. Spotted alfalfa aphid was not taken in INDIANA during 1960 until October 5, when it was found in Floyd County west of New Albany. Extensive survey was negative for any other locations in the Ohio River Valley. Spotted alfalfa aphid was found in fields of alfalfa in Caddo and Bossier Parishes, LOUISIANA, but not in sufficient numbers to cause damage. In GEORGIA, infestations of spotted alfalfa aphid were light during the 1960 season.

Some other species of aphids were reported infesting legumes in a few states, but to a much lesser degree than pea aphid and spotted alfalfa aphid. Scattered, heavy infestations of SWEETCLOVER APHID (Therioaphis riehmi) were observed in fields of seedling sweetclover through eastern NORTH DAKOTA, and counts remained very low in NEBRASKA from late April through early June. Sweetclover aphid was common in UTAH but not numerous during the 1960 season. Populations of YELLOW CLOVER APHID (T. trifolii) averaged 33 per sweep in one field of red clover in eastern ILLINOIS the week of July 10, with some pea aphid present. The clover was sticky from honeydew and somewhat stunted. CLOVER APHID (Anuraphis bakeri) averaged 20 per sweep in one field of clover in Kent County, DELAWARE, in late July but generally remained below economic proportions during 1960. Local, heavy populations of WATERLILY APHID (Rhopalosiphum nymphaeae) and BEAN APHID (Aphis fabae) occurred on Ladino clover and heronbill plantings in Glenn County, CALIFORNIA. APHIDS in general were prevalent and damaging to many field crops over the State. Seed crops of alfalfa and clover were generally infested, as well as grain sorghums.

MEADOW SPITTLEBUG (Philaenus leucophthalmus) nymphs were emerging as far north in ILLINOIS as Effingham the week of April 17 and in the northern area of the State by April 24. In early May, nymphs varied 0-270 per 100 stems in clover and alfalfa, averaging 34 in the northeast and 91 in the northwest. Adults were emerging during the week of June 5 and varied 0-1,600 per 100 stems in western Illinois, while nymphs still varied 0-40 per 100 stems. Fall survey showed a continued decline in meadow spittlebug populations in the State. The State average of adults per 100 sweeps in late August and early September for the last 3 years is as follows: 1958 - 1.48; 1959 - 1.01; 1960 - 0.80. Heaviest populations are in the northern section. Meadow spittlebug was again the most serious pest of alfalfa and red clover in INDIANA. Infestations were very heavy in the eastern area, particularly in counties along the Ohio border. Populations as high as 3-5 nymphs per stem were common during 1960. Damage to alfalfa by meadow spittlebug in VIRGINIA was minor during 1960, but the pest was a problem on alfalfa and red clover in 3 western counties of MARYLAND. Meadow spittlebug nymphs were first found on alfalfa in New Castle and Kent Counties, DELAWARE, in late April and adults began appearing on this crop by late May, remaining until early October. Meadow spittlebug was present in normal numbers in PENNSYLVANIA during 1960 and in RHODE ISLAND, nymphal infestations were heaviest in the northern section of the State, but no economic infestations were observed. Unspecified species of SPITTLEBUGS were moderate on first-crop alfalfa in CONNECTICUT during 1960, but below observations of previous years.

Several species of PLANT BUGS were reported as being of some importance on various forage crops during the 1960 season. Severity of damage and degree of infestation varied with the crop involved and the geographical area.

LYGUS BUGS (Lygus spp.) were generally prevalent over CALIFORNIA during 1960 and were among the most damaging pests in the State on alfalfa, beans and seed clover. This is probably the second most damaging group of insects in California. Infestations reached one per sweep in alfalfa throughout ARIZONA by the first week in May. The buildup continued and populations became very heavy throughout June, July, August and the first half of September. The decline which followed was gradual, with populations still high in some fields in November. Of significance during 1960 was the fact that there was little decline in lygus bug infestations during July and August in Arizona when there is normally a movement to other crops, particularly cotton. In NEVADA, heavy populations of lygus bugs developed statewide in alfalfa hay and seed fields, with periodic treatments necessary in seed fields. Large numbers of lygus bugs were present in fields of alfalfa in eastern OREGON, with counts of 3-5 adults per sweep and many nymphs hatching April 3-7. However, no particular problem developed.

Lygus bugs were again abundant in seed alfalfa in most areas of UTAH during 1960, resulting in reduced seed yields. Lygus bugs became important to alfalfa seed producers in WYOMING on July 10, when counts averaged 125 per 100 sweeps in untreated fields and 10 per 100 sweeps in treated fields. The population peaked about August 1 and began decreasing August 14. Lygus bugs were a problem in alfalfa seed-production fields in COLORADO. Lygus bugs were common in fields of alfalfa in most areas of OKLAHOMA from early spring until late fall. Heaviest count of 8-12 per sweep occurred in the southeast area during June and July but numbers were lighter (0.5-3 per sweep) in most areas throughout 1960. As in 1959, alfalfa in southeast and south central sections was infested with heavier populations of lygus bugs than any other general region of Oklahoma. Lygus bugs were noneconomic in KANSAS during 1960. Populations of lygus bugs were moderate in alfalfa during June and July in SOUTH DAKOTA, but appeared higher than usual in legumes in NORTH DAKOTA during the same period.

TARNISHED PLANT BUG (Lygus lineolaris) was more common in alfalfa in WISCONSIN during 1960 than in several previous years. Infestations of this pest were light to moderate in southern and southeastern NEBRASKA during April and May, but population increases during July and August brought counts up to 20-30 per 10 sweeps. Light populations of tarnished plant bug (0-6 per sweep) were present in alfalfa and red clover in MISSOURI throughout the 1960 growing season. In LOUISIANA, the bug was present in some fields of white and crimson clover. A total of 169 adults and 127 nymphs was collected in 100 sweeps in a field of crimson clover in Tensas Parish. Local infestations were reported on alfalfa in VIRGINIA during the season and adults and nymphs increased on alfalfa and clover over DELAWARE from mid-May until early August, then maintained a high population on these crops the remainder of the growing season in that State. Numbers were slightly lower in Delaware during 1960 as compared with 1959. Tarnished plant bug populations in VERMONT were exceptionally high in untreated trefoil in Addison County during 1960.

Surveys for ALFALFA PLANT BUG (Adelphocoris lineolatus) throughout the 1960 season in NEBRASKA showed that counts ranged 4-7 per 10 sweeps in alfalfa. This pest was found in small areas of SOUTH DAKOTA, but never in economic numbers, and no damage was observed. Alfalfa plant bug and RAPID PLANT BUG (A. rapidus) were more common in alfalfa in WISCONSIN during 1960 than in several previous years. Only light infestations of alfalfa plant bug occurred on alfalfa in New Castle and Kent Counties, DELAWARE, and none were found on this crop in Sussex County. Also in Delaware, and as in previous years, rapid plant bug never reached very high infestations for any prolonged period on clover and alfalfa, but did become numerous on clover in New Castle County from late May to early June and on alfalfa from late June to early July. In MARYLAND, rapid plant bug and tarnished plant bug were very abundant on alfalfa and red clover in central and western sections of the State during late May and early June; and local infestations of rapid plant bug occurred in VIRGINIA on alfalfa. Rapid plant bug continued light and spotted throughout NEBRASKA on legumes, with counts averaging 5-8 per 10 sweeps; and the population was moderate in SOUTH DAKOTA, with highest count approximately 19 per 10 sweeps on alfalfa in the eastern area of the State during late June.

Populations of GARDEN FLEAHOPPER (Halticus bracteatus) remained low on alfalfa in DELAWARE during the 1960 season and FALSE CHINCH BUG (Nysius ericae) was approximately 20 percent of that of 1958 in UTAH alfalfa. SAY STINK BUG (Chlorochroa sayi) damaged alfalfa seed in Millard County, UTAH, although the population was well below normal, statewide. Heavy populations of another STINK BUG (Euschistus conspersus) occurred on alfalfa, mainly in the Imperial Valley of southern CALIFORNIA. STINK BUGS in general were reported damaging alfalfa plantings in Imperial, Yuba and Sacramento Counties, California.

Infestations of THREE-CORNERED ALFALFA HOPPER (Spissistilus festinus) built up over ARIZONA in early June, reaching an average of 10 per 25 sweeps by the 18th. The buildup continued and populations were very heavy from late July through mid-September. Girdling damage was very evident in all areas of Arizona and the pest was probably the second most damaging insect on alfalfa during 1960. On alfalfa varieties resistant to spotted alfalfa aphid, three-cornered alfalfa hopper may well have been the most damaging of all. Adults of three-cornered alfalfa hopper averaged 1-5 per sweep in fields of alfalfa in southern counties of NEW MEXICO, with very little noticeable damage; however, damaging infestations occurred in the alfalfa-growing areas of TEXAS. Nymphs and adults of three-cornered alfalfa hopper caused visible damage to isolated fields of alfalfa in south central OKLAHOMA during September and October. Counts averaged 2-4 per sweep in the southern half of the State during this same period. Considerably lighter numbers (0.1-0.5 per sweep) were common throughout Oklahoma during most of the 1960 season. Three-cornered alfalfa hopper infestations on alfalfa and clover were about the same in LOUISIANA as in 1959, but damage was relatively light. In GEORGIA, three-cornered alfalfa hopper averaged 20 per sweep on alfalfa in Morgan County.

POTATO LEAFHOPPER (Empoasca fabae) was swept from alfalfa in the southwest area of WISCONSIN about May 27 and remained static (about 1-2 per 100 sweeps) until July 1, then increased slightly to 20-30 per 100 sweeps. By late July, potato leafhopper had increased to 50 per 100 sweeps, but populations never increased sufficiently in Wisconsin to cause yellowing of alfalfa. Adults of potato leafhopper were collected in ILLINOIS for the first time during 1960, on May 4, when one specimen was swept from alfalfa in the southern area and one was taken in a windsock at Urbana, Champaign County. Potato leafhopper entered the State in fair numbers on high winds May 5 and 6, being present statewide the week of May 15. A survey during the week of May 22 showed 0-20 per 100 sweeps in the northern section of Illinois, 80-400 in a band extending from Champaign to East St. Louis and 0-80 in the southern area of the State. Potato leafhopper populations remained relatively light in Illinois throughout 1960, with no serious damage. First infestations of potato leafhopper in MISSOURI occurred in southeast and south central areas in mid-July, with counts ranging 5-35 per sweep.

In mid-August, counts ranged 8-45 per sweep in the southwest and 15-100 in the central areas. Potato leafhopper caused yellowing of alfalfa in scattered fields in central and south central Missouri during August. Potato leafhopper also caused yellowing of alfalfa plants in a small area of central KANSAS during 1960 and averaged 8-20 per 10 sweeps on alfalfa during the summer in NEBRASKA.

Potato leafhopper caused some serious damage to alfalfa in VIRGINIA, but infestations were quite low in PENNSYLVANIA during 1960. Adults of potato leafhopper were first noted on alfalfa in Kent County, DELAWARE, during late May, with numbers gradually increasing throughout the growing season on this crop and reaching a peak in late August. In VERMONT, potato leafhopper damaged fields of alfalfa and hay in Addison County during the 1960 season.

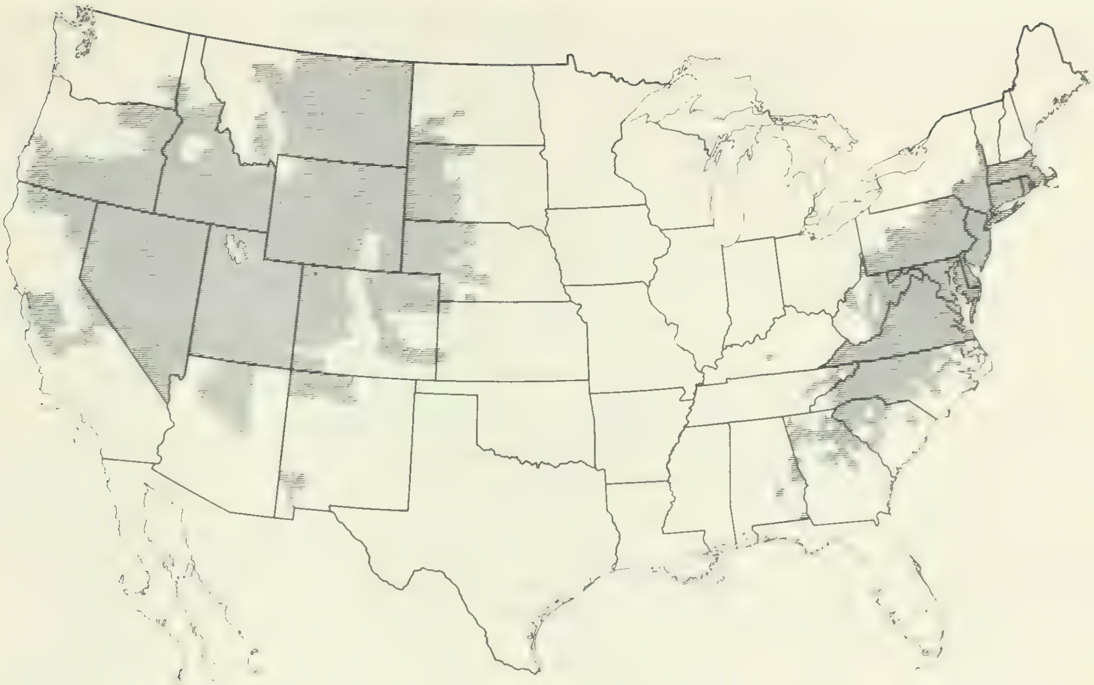
Adults of CLOVER LEAFHOPPER (Aceratagallia sanguinolenta) were present on clover in DELAWARE in early April, remaining on clover and alfalfa statewide throughout the 1960 season. The pest was abundant on fields of red clover in eastern and central MARYLAND during late April. Clover leafhopper was first noted in SOUTH DAKOTA the second week of May, but populations remained light all season on croplands, with counts averaging about 3 per 10 sweeps.

Undetermined species of LEAFHOPPERS severely defoliated alfalfa in some fields in Ashe County, NORTH CAROLINA, during the spring of 1960 and several species were responsible for limited damage to forage crops in OKLAHOMA. Leafhoppers, primarily Empoasca spp., were a problem on alfalfa in local areas of ARIZONA during the 1960 season.

A WHITEFLY (Trialeurodes sp.) was abundant on alfalfa statewide in DELAWARE during late August, causing some yellowing of leaves, and adults were common on this crop until early September.

ALFALFA WEEVIL (Hypera postica) was one of the major pests of alfalfa during 1960 and caused a considerable amount of damage in certain areas. The pest was reported from only one new state in 1960, however, that being KANSAS. Alfalfa weevil caused severe injury to alfalfa in CALIFORNIA, primarily in Modoc and Lassen Counties; and the pest was abundant enough in Malheur, Wallowa, Union, Lake and Klamath Counties, OREGON, to require controls, but generally no special threat existed in that State. In NEVADA, adult activity and egg laying began during mid-March, approximately a month later than in 1959. Development was very uneven again in Nevada, with the peak larval development occurring near mid-June. Damage by alfalfa weevil was minor in treated fields, except in Elko and Eureka Counties, where many treatments were ineffective. Untreated fields of alfalfa were severely damaged in all areas of Nevada during 1960 and in some areas the first crop was almost entirely lost. In UTAH, alfalfa weevil damaged a much larger acreage of alfalfa than usual.

Alfalfa weevil caused a high loss to first-cutting alfalfa in COLORADO, with weather conditions influencing application and effectiveness of early spring control measures. Populations were not as high as had been attained in the last few years in WYOMING, although fewer fields of alfalfa were controlled. Damage in most areas was light and occurred on second cuttings. However, alfalfa weevil was the most damaging pest in Wyoming during 1960. Alfalfa weevil is now present in all areas of MONTANA east of the Continental Divide, except for a few mountain valleys. Heavy damage occurred in newly infested areas, mainly in Teton and Cascade Counties, where control was not practiced. Alfalfa weevil was present only in southwest and south central areas of SOUTH DAKOTA during 1960 and caused considerable damage to alfalfa in cropland areas bordering the Black Hills. In NEBRASKA, light populations occurred in Scotts Bluff, Sioux and Dawes Counties, and alfalfa weevil was found for the first time in Logan County during the 1960 season. Specimens collected in fields of alfalfa in Cheyenne and Hamilton Counties, KANSAS, were determined as alfalfa weevil. Although the pest was suspected as being present in the State previously, this was the first positive identification.



Distribution of Alfalfa Weevil

Alfalfa weevil spread generally over the eastern third of TENNESSEE during 1960 from the 3 localized areas in which it was found during 1959 and seriously damaged approximately 500 acres of first-cutting alfalfa. Alfalfa weevil infestations were heavy in GEORGIA during 1960, being more severe than in previous years, with as many as 100 larvae per sweep common in many fields. This pest is now present in the northern tier of counties. Many acres of alfalfa were abandoned in Georgia due to poor control and destructiveness of alfalfa weevil during the spring. Alfalfa weevil was found on alfalfa in Perquimans, Transylvania, Avery, Jackson, Madison, Mitchell and Yancey Counties, NORTH CAROLINA, for the first time in 1960. Larvae and adults were active under snow cover in the western area of the State during late March. Larvae of alfalfa weevil so heavily damaged some fields of clover in the Piedmont that control would have been profitable. Alfalfa weevil was reported for the first time in VIRGINIA from Scott, Lee, Wise, Buchanan and Dickenson Counties, making distribution statewide. Heavy larval infestations occurred in some areas on untreated alfalfa and adults were observed migrating to alfalfa in late August, September and later.

Alfalfa weevil damage to first-growth alfalfa in MARYLAND was generally light to moderate during 1960, with severe injury to untreated fields noted in Allegany and Queen Annes Counties. Damage to second growth was above normal during the season and adults and larvae were present during the summer, increasing moderately in mid to late fall. Larvae and fresh egg clusters of the weevil were found in DELAWARE during mid-March. Larval numbers increased from this time and reached a peak in mid-May. Numbers were greater than during 1959 and injury to first-crop alfalfa was rather severe, causing early cutting in many areas. Only light larval feeding injury occurred on second-growth alfalfa. Nighttime counts in one field of alfalfa during early July yielded 51 adults per 10 sweeps. Alfalfa weevil larvae and adults remained present in Delaware until mid-October, with adults still present much later in the season.

Alfalfa weevil caused a great amount of damage over the entire infested areas of PENNSYLVANIA during 1960. Severe losses occurred in treated fields because of unsatisfactory control. The problem is so acute in Pennsylvania that farmers are beginning to consider a substitute for alfalfa for their forage supply. Possibly for the first time, alfalfa weevil caused commercial injury to alfalfa plantings in CONNECTICUT. This was primarily along the western boundary of the State, but there were some plots of alfalfa in the eastern section of the State that required treatment for the first time in order to preserve the crop. General activity of alfalfa weevil in Connecticut indicates that the pest is continuing to increase in importance. Overwintered adults and early instar larvae of alfalfa weevil were noted in RHODE ISLAND during the first week of May. The population built up to heavy proportions in local areas of the State during the season and there is a possibility the pest may be a general problem on alfalfa during 1961.

CLOVER LEAF WEEVIL (*Hypera punctata*) was commercially damaging to alfalfa in Siskiyou County, CALIFORNIA, during 1960. Larval populations of clover leaf weevil varied 0-92 per square foot in clover and alfalfa throughout ILLINOIS during April. Many newly emerged larvae were observed the latter half of April, thus extending feeding into late June; however, some pupation occurred in mid-May in southern Illinois. Disease was also present, killing larvae, but larval populations of clover leaf weevil still varied 0-25 per square foot. Some fields were damaged during 1960, with an estimated 4,852 acres treated in Illinois. Light populations of clover leaf weevil occurred throughout MISSOURI from mid-April until mid-May, counts ranging 0-10 larvae per crown. Larval numbers decreased to 0-3 per crown from mid to late May, as the result of a fungus disease. In KANSAS, clover leaf weevil was present in noneconomic numbers during the 1960 season; but was of concern on alfalfa in some areas of ARKANSAS during the season although the infestations were not evaluated. Clover leaf weevil larvae were fairly common on alfalfa in New Castle and Kent Counties, DELAWARE, during early April, causing noticeable feeding injury. In RHODE ISLAND, incidence of clover leaf weevil was light on alfalfa and red clover during 1960.

Larvae of LESSER CLOVER LEAF WEEVIL (*Hypera nigrirostris*) infested 40-100 percent of red clover stems in southern ILLINOIS by mid-May, killing many terminal buds and preventing development of stems and heads. Adults varied 0-40 per 100 sweeps at this time. Larvae of lesser clover leaf weevil infested 50-60 percent of red clover stems in western Illinois early in June. Adult activity was very light on susceptible crops in southern RHODE ISLAND during the spring of 1960. Adults of this weevil were present on clover and alfalfa in most areas of DELAWARE in April through July, heaviest population occurring during early July, with 2 per sweep in one field of clover in New Castle County. Larvae of lesser clover leaf weevil were common in axils and buds of red clover in all sections of MARYLAND during May. This weevil was reported for the first time from LOUISIANA during 1960, being collected on crimson clover in Washington Parish.

CLOVER HEAD WEEVIL (*Hypera meles*) appeared on white and crimson clovers in LOUISIANA during April and developed rapidly until mid-May, when larvae averaged one per sweep. Greatest populations occurred in Washington and Avoyelles Parishes, decreasing in July.

Infestations of EGYPTIAN ALFALFA WEEVIL (*Hypera brunneipennis*) increased from 3-4 per sweep to 10-12 per sweep in ARIZONA between mid and late March on Yuma-mesa alfalfa, with damage heavy during the period. Populations were much lighter in the Yuma and Gila Valleys. Light infestations of Egyptian alfalfa weevil also occurred in central counties of Arizona during 1960. No additional spread of this weevil was noted in CALIFORNIA during the past year. Although it now occurs in the coastal area of the State as far north as Santa Barbara County, it has not been particularly damaging except in a very few local areas on alfalfa. Damage to native stands of clovers, particularly burclover in pasturelands, has reduced or eliminated this plant in many southern ranges of California.

CLOVER ROOT CURCULIO (*Sitona hispidula*) was more abundant in NEW HAMPSHIRE during 1960 than during 1959. In RHODE ISLAND, larvae of clover root curculio were locally abundant and readily damaged tap roots of young alfalfa plants. Adults of clover root curculio were present on alfalfa and clover in New Castle and Kent Counties, DELAWARE, all season, but caused no noticeable feeding injury. It became more numerous in CONNECTICUT during 1960 after an almost complete disappearance from alfalfa plots during the 1959 season.

Very light populations of clover root curculio occurred in the southern two tiers of counties in NEBRASKA during May, and the pest was present in KANSAS in noneconomic numbers during 1960. This pest was active on vetch and clover in the Willamette Valley of OREGON from late April, and damage to foliage of field peas was noticed in several fields. Root damage by clover root curculio to new plantings of alsike clover in Klamath County and to red clover plantings in Clatsop County were drastically reduced over that found in the past 5 years.

High populations of SWEETCLOVER WEEVIL (*Sitona cylindricollis*) and severe injury occurred in fields of seedling sweetclover at several locations in eastern NORTH DAKOTA and the pest was present in all parts of SOUTH DAKOTA during 1960, with light damage. The highest count in South Dakota was 9 adults per 10 sweeps on yellow sweetclover in Minnehaha County. In NEBRASKA, sweetclover weevil caused light damage to seedling sweetclover. A general, low population occurred during April and May in the southeastern area of the State, with counts ranging 1-6 per 10 sweeps. Fall counts in Cass, Lancaster and Saunders Counties ranged 3-18 per 10 sweeps. Generally, sweetclover weevil populations were much higher in Nebraska than during the same period in 1959. Injury by sweetclover weevil was rarely serious in UTAH during 1960.

PEA LEAF WEEVIL (*Sitona lineata*) was active on vetch and clover in the Willamette Valley of OREGON from late April, with damage to foliage of field peas noticeable in some fields.

The range of a WEEVIL (*Sitona scissifrons*) increased in SOUTH DAKOTA during 1960 and the species may now be found in all of the eastern portion of the State and in many of the western river counties. *S. scissifrons* averaged 0-16 adults per sweep, depending on time and location, but damage to legumes in South Dakota is unknown. An unidentified species of WEEVIL ranged 3-14 per 10 sweeps in all fields of alfalfa checked in northeastern counties of NEBRASKA during late May. CLOVER SEED WEEVIL (*Miccotrogus picirostris*) was found for the first time in Henry, Ogle and Lake Counties, and another WEEVIL (*Tychius stephensi*) was found for the first time in Bureau, Winnebago and Livingston Counties, all in ILLINOIS. Still another WEEVIL (*Sitona flavescens*) began to reappear in CONNECTICUT after its almost complete disappearance from alfalfa plots during the 1959 season. Populations of *S. flavescens* were the same in NEW HAMPSHIRE during 1960 as in 1959.

BEAN LEAF BEETLE (*Cerotoma trifurcata*) adults were first noted on clover and alfalfa in New Castle and Kent Counties, DELAWARE, in late April and averaged 4 per 10 sweeps on alfalfa in Dakota and Thurston Counties, NEBRASKA, in late May. Populations were low throughout the growing season in MISSOURI, with no damage to legumes evident; and the pest caused a limited degree of damage to legumes in OKLAHOMA during 1960.

Adults of SOUTHERN CORN ROOTWORM (*Diabrotica undecimpunctata howardi*) were general statewide throughout the growing season on alfalfa in DELAWARE, but caused only light injury. As in 1959, adult numbers increased on this crop during October. Adults of this pest were first observed in fields of alfalfa in extreme southern ILLINOIS on April 17 and the pest was responsible for only a limited amount of damage to forage crops in OKLAHOMA during the 1960 season.

Several species of CORN ROOTWORMS (Diabrotica spp.) were present in NEBRASKA and caused considerable concern. Larval damage began in July and continued into August. Areas showing greatest damage were irrigated lands and river valleys, especially the Platte River Valley. WESTERN CORN ROOTWORM (D. virgifera) used corn as its primary host in NEBRASKA during 1960, but NORTHERN CORN ROOTWORM (D. longicornis) and southern corn rootworm adults migrated to alfalfa in late summer. During mid-August, counts of northern corn rootworm were as high as 83 per 10 sweeps and counts of southern corn rootworm were 30 per 10 sweeps on alfalfa in the southeast area of Nebraska. Adults of southern corn rootworm appeared during early June on alfalfa in southeastern SOUTH DAKOTA, followed by increasing numbers of western corn rootworm, and caused damage to stalks. Reports were received from all areas of the State.

PALE-STRIPED FLEA BEETLE (Systena blanda) averaged 3-6 per 10 sweeps on alfalfa in Dawes County, NEBRASKA, and adults were present on alfalfa by mid-June in DELAWARE.

Various BLISTER BEETLES were reported infesting leguminous crops during 1960. Tegrodera erosa was a local problem on alfalfa in San Diego County, CALIFORNIA; and several species of blister beetles were responsible for a limited amount of damage to legumes in OKLAHOMA and a few spots in scattered fields of alfalfa in MISSOURI. Moderate populations of Epicauta spp. occurred throughout the alfalfa-growing season in NEBRASKA, where averages were 10-15 per 10 sweeps, with the high record of 52 on alfalfa in Harlan County. ASH-GRAY BLISTER BEETLE (Epicauta fabricii) was first noted on legumes the second week of June in SOUTH DAKOTA, averaging 1-17 per 10 sweeps during June and July, depending on localities and weather conditions; however, no damage was evident. Adults of BLACK BLISTER BEETLE (E. pennsylvanica) first appeared in a field of alfalfa in Kent County, DELAWARE, during August and 6 adults per 10 sweeps caused light to moderate feeding injury in a field of alfalfa in New Castle County. Also in Delaware, adult infestations of a STRIPED BLISTER BEETLE (Epicauta sp.) were spotty on alfalfa during the season, with no general outbreak. A few adults of MARGINED BLISTER BEETLE (E. pestifera) were present in fields of alfalfa in RHODE ISLAND during midsummer.

High larval populations of GREEN JUNE BEETLE (Cotinis nitida) were present in some fields of fall-seeded alfalfa in Oregon County, MISSOURI, during early October. The larvae kept the soil loosened in these fields and caused alfalfa plants to die from lack of moisture. Larvae of green June beetle injured fall-planted alfalfa over TENNESSEE during 1960 and the widespread application of soil insecticides was used for control. Green June beetle larvae were common over VIRGINIA during the year, being especially abundant on a farm in Russell County.

JAPANESE BEETLE (Popillia japonica) was more severe during 1960 on forage crops than previously noted in VIRGINIA. Adults were locally heavy on alfalfa throughout RHODE ISLAND in mid-July.

Egg deposition by VETCH BRUCHID (Bruchus brachialis) began June 18 in the Willamette Valley of OREGON and infestations were above normal for the year. Infestations in NEBRASKA centered in a local vetch-growing area around Antelope County, and the species was identified for the first time during 1960 from specimens collected during 1959. Infestations during the 1960 season were non-economic. Vetch bruchid infestations caused heavy damage in the vetch-growing areas of north central and south central TEXAS during 1960.

CLOVER SEED CHALCID (Bruchophagus gibbus) was a severe pest on seed alfalfa and seed clovers in CALIFORNIA during 1960. Damage was estimated at 20-40 percent in most areas, with considerable research done during 1960 on the control of this pest. Clover seed chalcid was a problem on alfalfa in local areas of ARIZONA during 1960 and infestations in Nye County, NEVADA, were greatly reduced compared with those of 1959. The pest caused about the average amount of economic damage in UTAH during the 1960 season.

Undetermined species of THRIPS deformed leaves of alfalfa in fields throughout most of NEW MEXICO. Many growers had to treat seedling stands during the spring of 1960 in Dona Ana, Chaves and Eddy Counties. Infestations of Frankliniella occidentalis were extremely heavy in some fields in all alfalfa-growing areas of ARIZONA throughout the 1960 season, considerable damage to terminal growth being evident in some cases.

Moderate numbers of a SNOWY TREE CRICKET (Oecanthus sp.), as high as 36 per 10 sweeps in some fields, occurred in most fields of alfalfa in northeast and north central areas of SOUTH DAKOTA during 1960, with ovipositing noted in alfalfa stems. Also in South Dakota, the population of FIELD CRICKETS (Acheta spp.) was high during the fall, with damage reported to alfalfa seed production. The major occurrence of field crickets in CALIFORNIA was in the Imperial Valley where alfalfa and seed alfalfa were damaged.

LEAF MINERS (Agromyza spp. and Melanagromyza spp.) were not as prevalent on alfalfa and beans in CALIFORNIA during 1960 as during past years.

Light infestations of a SPIDER MITE (Tetranychus cinnabarinus) occurred in ARIZONA from early May throughout the summer on alfalfa used for hay in Yuma County. Infestations became very heavy in seed fields during July and August, with damage heavy in many cases. In NEVADA, heavy populations of BROWN WHEAT MITE (Petrobia latens) developed on alfalfa in northern counties. An outbreak of STRAWBERRY SPIDER MITE (Tetranychus atlanticus) occurred in OREGON on alfalfa near Nyssa, Malheur County, during mid-August. TWO-SPOTTED SPIDER MITE (Tetranychus telarius) was common on alfalfa in greenhouses in ALASKA during 1960. In CALIFORNIA, two-spotted spider mite damaged alfalfa in Sacramento County and alfalfa and seed alfalfa in Kern County. MITES in general were damaging to seed crops in California during 1960, alfalfa and clovers being among the most severely affected crops.

Soybean, Peanut, Field Pea Insects: Several lepidopterous pests were reported on soybeans during the 1960 season from various areas, but generally infestations were not as damaging as during 1959. CORN EARWORM (Heliothis zea) was the most important pest of soybeans in ARKANSAS during 1960. Infestations became economic in many fields during late August and early September, with late-planted soybeans being more attractive to the pest than early planted soybeans. Moths moved to soybeans as cotton became unattractive. A total of 129,140 acres of soybeans were treated in Arkansas for this pest during 1960. Light to moderate infestations of corn earworm occurred on soybeans in GEORGIA; damage was widespread in eastern VIRGINIA; larval infestations in soybean pods about normal in MARYLAND; and larvae were light on soybeans statewide in DELAWARE during September and October. The pest was generally less severe on soybeans in Virginia than during the 1959 season, however, and timely application of controls reduced severity from what was anticipated in the eastern area.

Larvae of GREEN CLOVERWORM (Plathypena scabra) first occurred on alfalfa in Kent County, DELAWARE, in late May, gradually increasing to injurious proportions on several leguminous crops, including soybeans, by early July throughout the State. Larvae remained common to numerous on soybeans throughout July, August, September and October, with noticeable feeding injury. Only light infestations of this species were recorded on soybeans in MARYLAND, but the pest was quite common on this crop in ARKANSAS during 1960.

Infestations of VELVETBEAN CATERPILLAR (Anticarsia gemmatalis) on soybeans in GEORGIA ranged light to moderate during 1960. An adult of velvetbean caterpillar was found on the LOUISIANA State University campus in June, the earliest record of appearance in the State. The first light trap collection in Baton Rouge was made August 26, but only 161 moths were collected during 1960 compared with 609 in 1959. Larval infestations were unusually light in Louisiana during 1960 and only one heavy infestation was observed on soybeans at Port Barre, St. Landry Parish.

As in 1959, larvae of CABBAGE LOOPER (Trichoplusia ni) were present on soybeans in DELAWARE from early August to mid-October, with population levels remaining very low. In GEORGIA, infestations of cabbage looper were light to moderate on soybeans. In VIRGINIA, local infestations of ARMYWORM (Pseudaletia unipuncta) occurred on late soybeans and BLACK CUTWORM (Agrotis ipsilon) caused some damage to soybeans in King George, Westmoreland, Northumberland, Richmond and Lancaster Counties. LESSER CORNSTALK BORER (Elasmopalpus lignosellus) caused some damage to soybeans in many sections of TEXAS and in East Baton Rouge Parish, LOUISIANA, one field of soybeans was severely damaged by this pest. ALFALFA CATERPILLAR (Colias eurytheme) attacked soybeans throughout DELAWARE during the last week of June and the first 2 weeks of July, but caused only light injury.

Several species of leaf beetles were found infesting soybeans during the 1960 season. Heaviest adult BEAN LEAF BEETLE (Cerotoma trifurcata) infestations in DELAWARE occurred on soybeans from mid-May to mid-June, causing moderately heavy feeding injury. Adults remained present to fairly common on this crop until early October in all areas of the State. In LOUISIANA, the pest caused damage to soybeans in Madison, Tensas and East Carroll Parishes in September. Bean leaf beetle was common throughout ILLINOIS during 1960 and was responsible for the treatment of several fields of soybeans, with both adults and larvae causing damage. Reports of 20-30 percent of leaf surface removed by adults were common by mid-June, and some reports of 25 percent of leaf surface removed were received in early August. Larvae occurred about roots of soybean plants as far north as Springfield, Sangamon County, by June 19. An average of 16.3 bean leaf beetle larvae per linear foot in one field in southeastern Illinois the week of July 10 was the largest number found. Bean leaf beetle and SOUTHERN CORN ROOTWORM (Diabrotica undecimpunctata howardi) caused considerable reduction in yield of soybeans in the western portion of IOWA during 1960. The loss was due mainly to the destruction of flower buds and damage to pods by adults.

Adults of southern corn rootworm were first observed on alfalfa in extreme southern ILLINOIS on April 17 and were commonly found feeding on leaves of soybeans throughout the State by mid-June. Adults were general statewide throughout the growing season on soybeans in DELAWARE, but caused only light injury. As in 1959, adults of this pest increased on soybeans during October. Light infestations of BANDED CUCUMBER BEETLE (Diabrotica balteata) were observed on soybeans by mid-July in LOUISIANA and by September 1 these infestations had increased considerably.

Adults of PALE-STRIPED FLEA BEETLE (Systena blanda) first appeared on soybeans in Kent County, DELAWARE, during late May to early June. Adults became common on soybeans in New Castle County by July 1, causing light injury. Adults of another FLEA BEETLE (Phyllotreta sinuata) became fairly common on soybeans in Kent County during late June, but also caused only light feeding injury. Infestations of a CHRYSOMELID (Maecolaspis sp.) on soybeans in ARKANSAS were lighter during the 1960 season than in 1959.

Adults of MARGINED BLISTER BEETLE (Epicauta pestifera) were present to common on soybeans in Kent and Sussex Counties, DELAWARE, during late July and August, causing moderate feeding injury and adult infestations of a STRIPED BLISTER BEETLE (Epicauta sp.) were spotty on soybeans during the season in the State, with no general outbreak occurring. BLISTER BEETLES were abundant in some fields of soybeans in southeastern ILLINOIS and a few isolated spots in scattered fields of soybeans in MISSOURI were defoliated by Epicauta spp. during August.

Adults and larvae of MEXICAN BEAN BEETLE (Epilachna varivestis) became very abundant in several fields of soybeans in southwestern Sussex County, DELAWARE, during September and early October, causing severe damage in several fields; and high population densities of the pest were commonly encountered on soybeans in VIRGINIA. Mexican bean beetle was the principal injurious pest reported on soybeans in NORTH CAROLINA during 1960. Injury was light in Carteret County, but with every plant injured by mid-May. Approximately 75 percent of leaves of soybeans were injured by mid-June in Scotland County, North Carolina, by this pest. In GEORGIA, Mexican bean beetle ranged light to moderate on soybeans during the 1960 season.

CLOVER ROOT CURCULIO (*Sitona hispidula*) adults were present on soybeans in New Castle and Kent Counties, DELAWARE, all season, but caused no noticeable feeding injury. COWPEA CURCULIO (*Chalcodermus aeneus*) was one of the 2 principal pests attacking field peas in NORTH CAROLINA during the 1960 season. In some areas of Wake County, the curculio caused up to 31 punctures per pod in mid-August. Larvae emerged from dried peas by mid-September. Infestations on cowpeas in GEORGIA ranged light to moderate during 1960.

JAPANESE BEETLE (*Popillia japonica*) populations in Newton County, INDIANA, where agricultural land was involved, were higher than during 1959, although not severe enough to cause damage to soybeans. In central ILLINOIS, a WHITE GRUB (*Phyllophaga rugosa*) damaged soybeans in spotted areas during July and adults of a SCARAB (*Strigoderma arboricola*) averaged one per 6 linear feet and fed on leaves of soybeans in a field in the central area of the State during late June.

As in previous years, RAPID PLANT BUG (*Adelphocoris rapidus*) never reached very high infestations in DELAWARE for any prolonged period on soybeans during 1960. Also in Delaware, populations of GARDEN FLEAHOPPER (*Halticus bracteatus*) remained low on soybeans, with the heaviest infestation occurring during mid-August when counts averaged 2-3 per sweep and adults of POTATO LEAFHOPPER (*Empoasca fabae*) were first noted in Kent County during late May and numbers gradually increased throughout the 1960 growing season on soybeans, reaching a peak in late August.

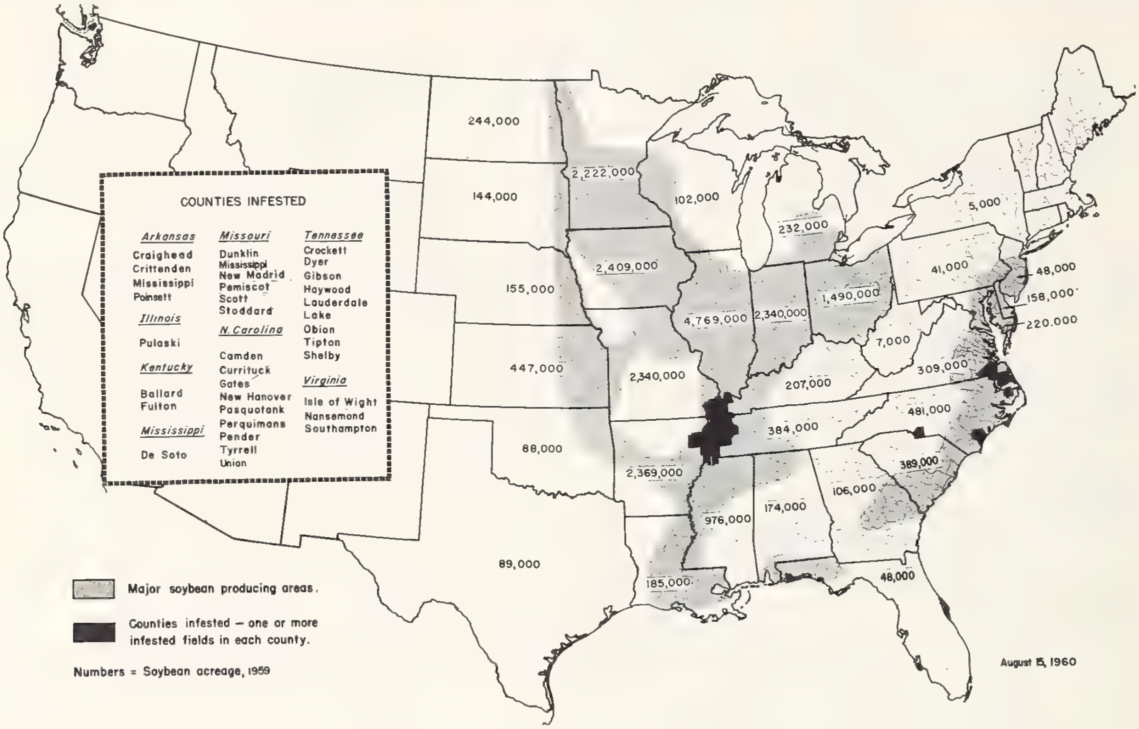
Infestations of STINK BUGS occurred in a large number of fields of soybeans in ARKANSAS during 1960. Though these pests were present in small numbers in scattered fields throughout the 1960 season, infestations became heavier and more widespread in September and remained in soybeans until harvest. The principal species were SOUTHERN GREEN STINK BUG (*Nezara viridula*), RICE STINK BUG (*Oebalus pugnax*) and BROWN STINK BUG (*Euschistus servus*). Some 9,670 acres were treated for control of this group of pests in Arkansas during the 1960 season. The appearance of stink bugs on soybeans was later than usual in LOUISIANA, but by mid-September and late into October heavy infestations, primarily southern green stink bug, were causing considerable damage to soybeans in Tensas, East Carroll and St. John the Baptist Parishes. Also in Louisiana, heavy infestations of THREE-CORNERED ALFALFA HOPPER (*Spissistilus festinus*) appeared in some fields of soybeans in East Baton Rouge and St. Landry Parishes.

An APHID (*Aphis craccivora*) was one of the 2 principal pests attacking field peas in NORTH CAROLINA during the 1960 season. Infestation was much heavier than during 1959, with some garden plantings being destroyed. A WHITEFLY (*Trialeurodes* sp.) was abundant on soybeans statewide in DELAWARE during late August and caused some yellowing of leaves. Adults were common on this crop until early September.

SPIDER MITES were of some concern on soybeans in DELAWARE during 1960. STRAWBERRY SPIDER MITE (*Tetranychus atlanticus*) increased on soybeans in Kent and Sussex Counties, particularly the latter county, in late July and early August; however, numbers declined shortly thereafter. Another SPIDER MITE (*Tetranychus lobosus*) was found on soybeans in Sussex County, Delaware, for a new State record.

A THRIPS (*Sericothrips variabilis*) occurred on soybeans in DELAWARE during early June, increasing in numbers through August. Injury, in the form of yellow spots, was noticeable in late June and early July in all areas of the State. Streaking, due to various species of THRIPS, was noticeable on soybeans in MARYLAND during the summer of 1960.

Surveys and quarantine actions are minimizing the opportunity for the spread of SOYBEAN CYST NEMATODE (Heterodera glycines). The known infestation - fields where cysts have been found - (50,000 acres - 1,017 farms - 35 counties - 8 states), is less than 2 percent of the 25 million acres producing soybeans each year. Only 5 new counties were reported infested in 1960. They were as follows: Poinsett County, ARKANSAS; Mississippi and Scott Counties, MISSOURI; Union County, NORTH CAROLINA; and Crockett County, TENNESSEE. There is yearly evidence of damaging losses from this nematode under certain environmental conditions. Research indicates that crop rotation and use of nematocides will afford some protection.



Status of Soybean Cyst Nematode

Peanuts in GEORGIA were infested by several pests common to this crop during the 1960 season. Infestations of GRANULATE CUTWORM (Feltia subterranea) caused heavy defoliation of peanuts throughout the major peanut-producing counties of the State and caused considerable concern, as 4-5 days were required after the application of controls to kill the pest. Light to moderate infestations of CORN EARWORM (Heliothis zea), FALL ARMYWORM (Laphygma frugiperda) and RED-NECKED PEANUTWORM (Stegasta basqueella) occurred on peanuts in Georgia during 1960. Infestations of LESSER CORNSTALK BORER (Elasmopalpus lignosellus) were also light to moderate on peanuts in the State; however, the infestation was generally lighter than during 1959. Infestations of a BURROWING STINK BUG (Pangaeus bilineatus) were generally light on peanuts during the 1960 season. During 1959, this pest was heavy on Spanish peanuts in some areas of Georgia. Infestations of undetermined species of THRIPS on peanuts in the State were very heavy, being heavier than in previous years.

Peanuts in some other states were infested and damaged by some of these same pests, as well as a few others. Corn earworm caused considerable damage to peanuts in the eastern portion of VIRGINIA during 1960. However, timely application of controls reduced severity from what was anticipated. Infestation was considered less severe than during 1959. Infestations of corn earworm damaged peanuts in all areas of TEXAS where this crop is grown, and lesser cornstalk borer caused some damage to peanuts in many sections. Although red-necked peanutworm continued to cause some concern to peanut growers in OKLAHOMA during 1960, infestations were generally lighter than those noted during 1959. SOUTHERN CORN ROOTWORM (Diabrotica undecimpunctata howardi) caused considerable loss in yields of peanuts in some areas of VIRGINIA during the 1960 season where controls failed. An APHID (Aphis craccivora) infested peanuts in Hertford County, NORTH CAROLINA, in mid-July. Also in North Carolina, EASTERN SUBTERRANEAN TERMITE (Reticulitermes flavipes) so severely injured pods and roots of peanuts in Gates County as to cause the plants to wilt in the hot weather during late July. Damaging infestations of TOBACCO THRIPS (Frankliniella fusca) and FLOWER THRIPS (F. tritici) occurred in many fields of peanuts in OKLAHOMA during the early part of the 1960 growing season in most production areas in the State, with light to moderate damage being noted.

Pasture and Grass Insects: Several species of Lepidoptera infested grasses, lawns, turf, pastures and range areas during 1960, with infestations and damage ranging from light to heavy or severe. The most important species was probably FALL ARMYWORM (Laphygma frugiperda). A very severe outbreak of this pest occurred on pastures in eastern LOUISIANA during July. This outbreak was first noticed at the beginning of July and by August had assumed major proportions, with more than 100 larvae per sweep collected in most fields. Fall armyworm populations began to decrease by mid-September in Louisiana and had practically disappeared by the end of the month. At this time, many larvae were found diseased or parasitized. Dallas grass and Bermuda grass were heavily damaged and some infestations of lawns were reported from St. John the Baptist Parish.

Populations of fall armyworm in TEXAS were extremely heavy during the early fall of 1960 on pastures and lawns, causing extensive damage throughout the State. Medium to heavy damage to lawns was common in all areas of OKLAHOMA during September and October, and was the heaviest, widespread damage noted in the State during the past several years. In ARKANSAS, fall armyworm became a serious pest of pastures and lawns in midsummer, primarily in the southern two-thirds of the State. The pest also destroyed many lawns in Shelby County, TENNESSEE, and infestations ranged light to heavy in GEORGIA on Coastal Bermuda grass. In late August, larval counts as high as 15-20 per square foot attacked all grass cover crops in Haywood County, NORTH CAROLINA, and infestations caused local injury to lawns in many areas of the State. In VIRGINIA, fall armyworm infested Sudan grass and ARMYWORM (Pseudaletia unipuncta) infested grasses in local areas.

Larvae of BLACK CUTWORM (Agrotis ipsilon) were numerous on several lawns at Logan, Cache County, UTAH, during September. Also in Utah, ARMY CUTWORM (Chorizagrotis auxiliaris) damaged much less range plant acreage than usual during 1960, although there was an outbreak in Box Elder County. Army cutworm infested extensive acreages of rangeland in Malheur County, OREGON, during early April, with larval populations between Nyssa, Vale and Adrian being particularly heavy. GLASSY CUTWORM (Crymodes devastator) required controls in fields of grass in Union County, Oregon, during September. Also in Union County, Oregon, SOD WEBWORMS (Crambus spp.) damaged grass seed fields during late summer, with larvae observed spinning up overwintering cocoons October 17-27. In NORTH DAKOTA, several infestations of a SOD WEBWORM (Crambus mutabilis) occurred at Fargo, Cass County; injury ranged light to moderate. Predation by birds was evident in some yards. Sod webworms damaged a number of lawns in North Platte, NEBRASKA, in early August; and in KANSAS, Crambus spp. were the most serious pests of turf. Many lawns were completely, or to a large extent, killed by these pests in the eastern portion of the latter State.

WHEAT HEAD ARMYWORM (Faronta diffusa) averaged 3 per 10 sweeps in a pasture in Buffalo County, NEBRASKA. WHITE-LINED SPHINX (Celerio lineata) caused concern in several areas of NEVADA during the 1960 season, but little or no damage occurred except to range plants. A large rangeland infestation of white-lined sphinx occurred in Malheur County, OREGON, with populations of 5 larvae per square yard observed June 19-20.

Larvae of JAPANESE BEETLE (*Popillia japonica*) caused some injury to pastures in NORTH CAROLINA during 1960 and were very abundant in lawns in numerous localities of VIRGINIA. Adults and larvae of Japanese beetle were very numerous in some localized areas of CONNECTICUT during the year. Most of these places were new developments, formerly fields or brush areas, where the entire areas were regraded. Larval damage to these new lawns was extensive and local vegetation was eaten by adults. Also in Connecticut, ORIENTAL BEETLE (*Anomala orientalis*) larvae caused damage to turf in localized areas of New Haven and Fairfield Counties. In PENNSYLVANIA, NORTHERN MASKED CHAFER (*Cyclocephala borealis*), with the incidental damage of skunks digging for the larvae, created havoc on a golf course in Fayette County.

Larvae of GREEN JUNE BEETLE (*Cotinis nitida*) were common over VIRGINIA during 1960 and infested lawns in numerous localities, and were one of the principal pests of pastures in NORTH CAROLINA during 1960. Following heavy rains in the eastern Piedmont of North Carolina during early October, larvae caused complaints from citizens by crawling on sidewalks and drives. Green June beetle larvae also injured fall-planted pasture seedings over TENNESSEE, with the widespread application of soil insecticides being used for control. WHITE GRUBS (*Phyllophaga* spp.) infested pastures in several areas of VIRGINIA during the 1960 season. In NEVADA, a WHITE GRUB (*Phyllophaga anxia*) damaged native pasture in Elko County and a SCARAB (*Paracotalpa* sp.) was numerous on rangeland in many counties. SCARABS (*Cyclocephala* spp. and others) were more abundant in CALIFORNIA during 1960 than for several years; however, no commercial damage was reported. Damage to lawns and nuisance value were more common.

A CERAMBYCID (*Derobrachus brevicollis*) continued destructive to root systems of Bahia grass in Seminole County, GEORGIA, during 1960. Some growers are plowing up Bahia grass and establishing Coastal Bermuda grass. BLACK BLISTER BEETLE (*Epicauta pennsylvanica*) was high in numbers during 1960 in NORTH DAKOTA, with counts of 21 per sweep found in some weedy soil bank fields in north central, central and south central areas, and damage was evident. A BILLBUG (*Sphenophorus* sp.) infested a lawn in Pershing County, NEVADA.

Infestations of several other pests were recorded as infesting grasses and range across the Nation during 1960. A SCALE INSECT (*Odonaspis ruthae*) infested Bermuda grass lawns in Clark County, NEVADA; an APHID (*Hyalopteroides dactylidis*) lightly infested orchardgrass over a large area in UTAH during 1960 and several MIRIDS (*Stenotus binotatus*, *Leptopterna ferrugatus* and *Thyrillus pacificus*) damaged grasses spottedly in scattered areas of the State; and another MIRID (*Irbisia* sp.) attacked crested wheatgrass grown for seed in Chouteau County, MONTANA. Emergence of a CICADA (*Okanagana luteobasilis*) was first reported in WYOMING on June 17, and sporadic emergence occurred throughout the western half of the State until August 1. These cicadas were confined to range areas and to low elevation timber stands. Very low populations of SIX-SPOTTED LEAFHOPPER (*Macrosteles fascifrons*), averaging 2 per 10 sweeps, occurred on grasses throughout NEBRASKA during the 1960 season.

Damage to St. Augustine grass lawns by a CHINCH BUG (*Blissus leucopterus insularis*) *insularis*) was extremely severe in LOUISIANA again during 1960. Many lawns were completely destroyed in the southern half of the State and damage was observed as far north as Caddo Parish. This chinch bug first appeared in May, populations building up rapidly thereafter, and was still present in lawns in September. RHODES-GRASS SCALE (*Antonina graminis*) heavily infested a St. Augustine grass lawn in Eunice, St. Landry Parish, Louisiana, in September. Infestations of a SPITTLEBUG (*Tomaspis bicincta*) were light on Bermuda grass in GEORGIA, although the species usually causes a great deal of damage in the State. MEADOW PLANT BUG (*Leptopterna dolabratus*) was common on orchardgrass in Montgomery and Howard Counties, MARYLAND, during late May and early June. Nymphal infestations of MEADOW SPITTLEBUG (*Philaenus leucophthalmus*) on grasses in RHODE ISLAND were heaviest in the northern section of the State, but no economic infestations were observed during 1960.

A SAWFLY (*Dolerus* sp.) was very abundant on grass in many areas of ILLINOIS and was probably responsible for some of the armyworm treatments applied to wheat. Another SAWFLY (*D. wanda*) was found for the first time in Illinois during 1960, infesting grass. ANTS were of some concern on rangeland during 1960.

WESTERN HARVESTER ANT (*Pogonomyrmex occidentalis*) caused the usual extensive damage in UTAH by keeping thousands of acres of range and forage croplands bare. The other harvester ants, *P. occidentalis comanche* and *P. maricopa barnesi*, were troublesome in the Washington-St. George area in the southwestern section of the State. Ranchers in San Miguel, Lincoln and Socorro Counties, NEW MEXICO, are becoming disturbed about the increasing numbers of hills of *Pogonomyrmex* spp. on rangeland. Several areas in these counties averaged 15-40 hills per acre. One area near Pecos, San Miguel County, averaged over 50 hills per acre. In TEXAS, FIRE ANT (*Solenopsis geminata*) infestations were moderate to locally heavy during late fall in several south central counties, and *Formica cinerea lapida* and *Formica* sp. infested large acreages of rangeland in Dallam and Hutchinson Counties during 1960.

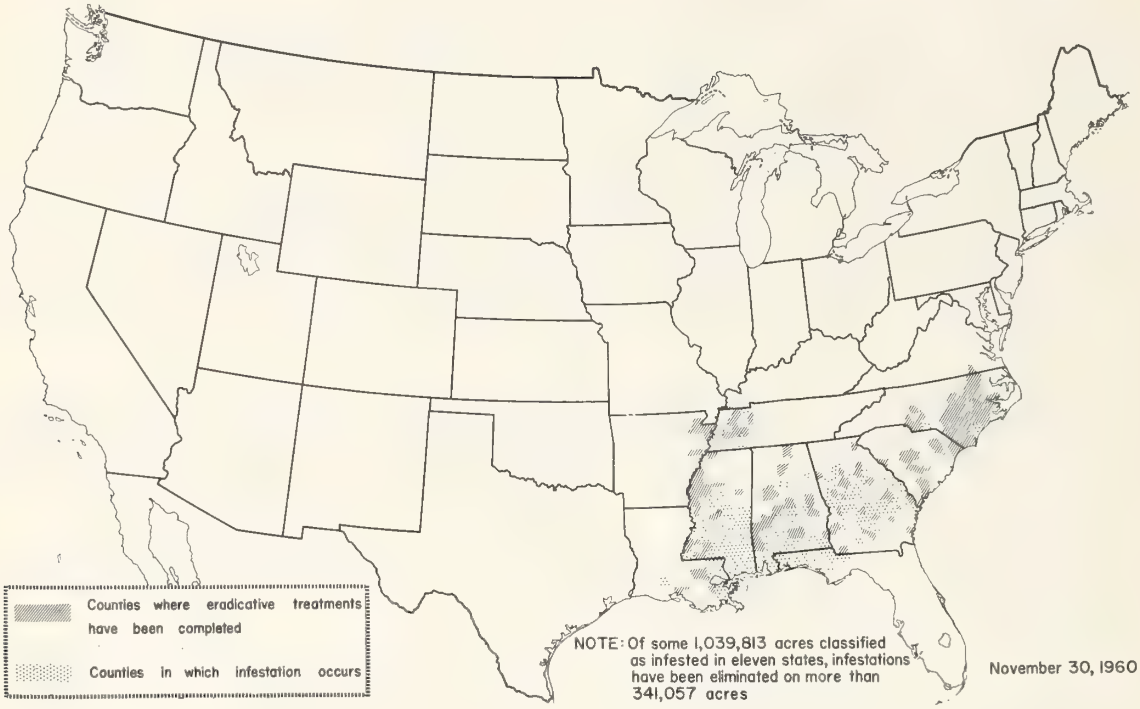
An ERIOPHYID MITE (*Aceria neocynodonis*) was a new pest reported infesting plantings of Bermuda grass in the desert area of CALIFORNIA during 1960 early in the summer, and as far north as Los Angeles County by early fall. This mite was described by H. H. Keifer in November of this year. The mite also damaged Bermuda grass lawns in all southern counties of ARIZONA during the Bermuda grass growing season. MITES in general were damaging to seed crops in California, pasture grasses being one of the most severely affected.

THRIPS (*Chirothrips falsus* and *C. mexicanus*) were also a problem on Bermuda grass in local areas of ARIZONA during the year and FIELD CRICKETS (*Acheta* spp.) were present in very high numbers in many soil bank fields in SOUTH DAKOTA during 1960. RANGE CRANE FLY (*Tipula simplex*) caused severe damage in CALIFORNIA to several thousand acres of rangeland and permanent pastures in Marin and Sonoma Counties, and damaged one large grain planting in Sacramento County. The pest was prevalent from October on. Range crane fly is only a periodic pest in California. FRIT FLY (*Oscinella frit*) damaged turf on golf greens in localized areas of Fairfield, Hartford and New Haven Counties, CONNECTICUT, but principally in Hartford County.

Pests of Flax: Populations of FIELD CRICKETS (*Acheta* spp.) increased greatly in western counties of MINNESOTA, and there were a few reports of clipped bolls in swathed flax; however, most crops escaped damage. Fall grasshopper surveys in the State showed heavy cricket egg laying in the west central district. High populations of field crickets in eastern and central areas of NORTH DAKOTA caused some damage to flax, with controls being applied in some areas for crop protection. A heavy infestation of undetermined species of WHITE GRUBS destroyed 200 acres of flax near Chaffee, Cass County, and low populations of SIX-SPOTTED LEAFHOPPER (*Macrosteles fascifrons*) were recorded in most fields of flax surveyed in North Dakota during the 1960 season.

Miscellaneous Pests: WHITE-FRINGED BEETLES (*Graphognathus* spp.) extended their range in 1960 to include one county each in VIRGINIA and KENTUCKY. *G. leucoloma striatus* was recorded in Fulton County, Kentucky, and *G. leucoloma imitator* was detected in Greensville County, Virginia. By the end of the year, eradicative treatments had been completed in both areas. In addition to the Virginia and Kentucky records, white-fringed beetles were found in a number of counties in several other states for the first time during 1960. They were as follows: Cullman County, ALABAMA; Craighead, Greene and Mississippi Counties, ARKANSAS (St. Francis County, Arkansas, was found infested for the first time during 1959); Webster County, GEORGIA; Beaufort, Greene, Halifax and Northampton

Counties, NORTH CAROLINA; and Benton, Crockett, Dyer, Fayette, Lauderdale, Maury and Weakley Counties, TENNESSEE. The white-fringed beetle infestation in NEW JERSEY was declared eradicated this year following the third year of negative surveys since the last eradication treatments were applied. The aggressive treatment program in support of regulatory work that is followed in all areas where white-fringed beetles are found has continued to keep these pests depressed to noneconomic levels. Plant Pest Control Division and state personnel have been very successful in obtaining the cooperation of property owners to assist with eradication or control where infestations have been found. The first adults to emerge in North Carolina this past year were on June 9 in Pender County.


▨ Counties where eradicative treatments have been completed
░ Counties in which infestation occurs

NOTE: Of some 1,039,813 acres classified as infested in eleven states, infestations have been eliminated on more than 341,057 acres

November 30, 1960

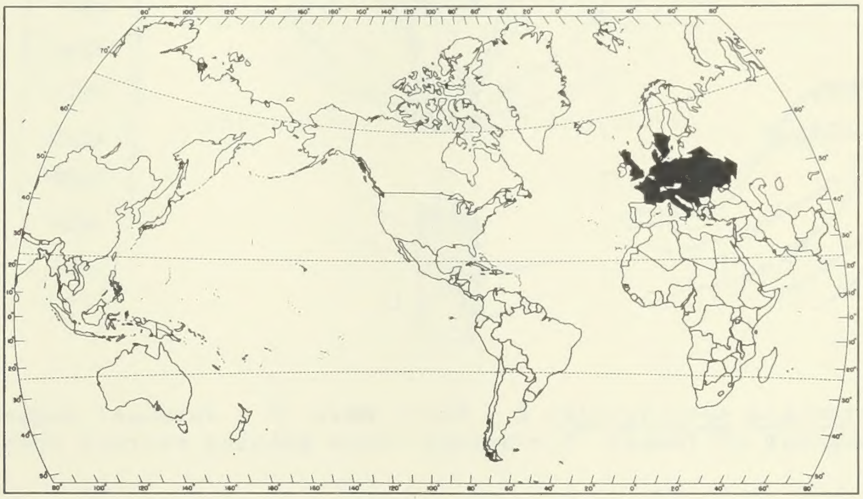
Status of White-Fringed Beetles

INSECTS NOT KNOWN TO OCCUR IN THE UNITED STATES

ALFALFA FLOWER MIDGE (Contarinia medicaginis Kieffer)

Damage to Alfalfa

Economic Importance: This midge is a pest of alfalfa in most alfalfa-growing areas of Europe. Severe damage has been reported on occasions during the past 25 years in Sweden, Denmark, Germany, Czechoslovakia and Yugoslavia. Infestations of 100 percent were recorded in 1937 in Sweden, and more recently, a 50 percent infestation was recorded in Yugoslavia. The severity of infestations depends a great deal upon the weather. During dry years in Czechoslovakia, the emergence date of the adults is delayed and the number of generations consequently reduced. It was reported in the USSR that irrigated fields suffer from much greater populations of the pest. It was also determined in Czechoslovakia that a low infestation in one year may not result in a low infestation the following year. It is suspected that pupae may lay dormant throughout the summer when drought conditions persist. Infested flowers of the alfalfa plant are characteristically shut and swollen. The calyx of infested flowers is always split opposite the standard, the corolla is swollen at the base and the standard envelops the other petals; the stamens are hypertrophied and fleshy, while the ovary remains short and thickened. When the foregoing conditions exist, loss of seed results.



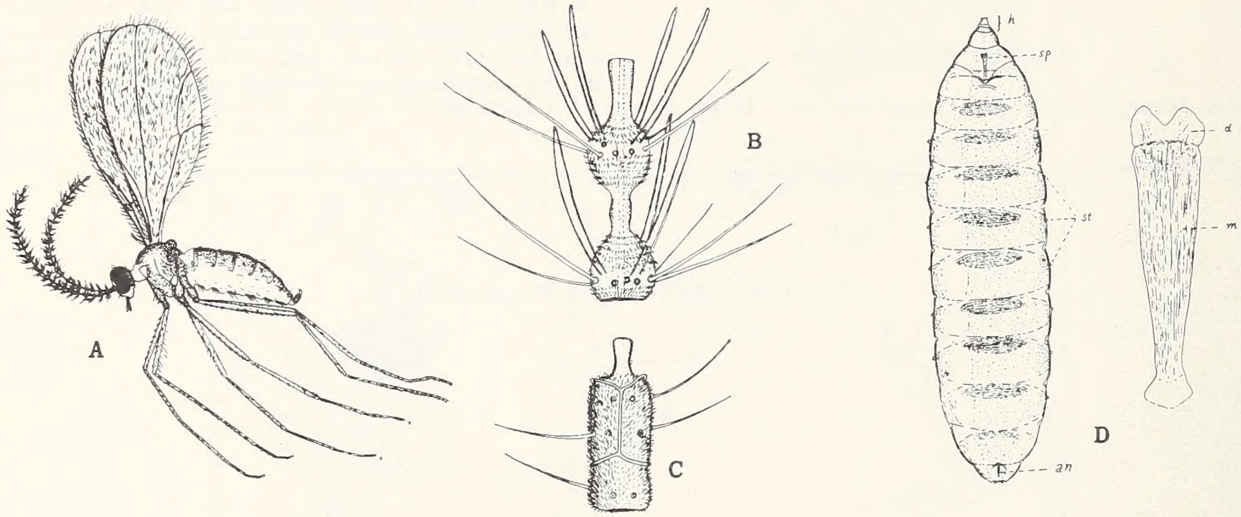
General Distribution of Contarinia medicaginis Kieffer

Distribution: Widely distributed in Europe, being recorded in Czechoslovakia, Denmark, France, Germany, Great Britain, Holland, Hungary, Italy, Poland, Romania, Sweden, Yugoslavia and in southeastern European USSR.

Hosts: Alfalfa and spotted medic.

Life History and Habits: The biology as recorded by F. Ossiannilsson in Sweden is as follows: Emergence of the adults begins in mid-June and lasts until early August, with peaks in warm weather. Males emerge a day earlier than the females. Adults live only a few days, unpaired females slightly longer, and no food or water is taken. The sex ratio of laboratory emergences was 43 percent males and 57 percent females. Females oviposit chiefly in the evening in the unopened blossom of alfalfa. The average number of larvae per blossom was nearly 5. In the laboratory, the egg period lasted 2 days and the larval about 12. In the soil, larvae spin cocoons at a depth of over 3 cm. at first, but later they leave these cocoons to spin other ones at lesser depths where they pupate. Damp soil is preferred for pupation. Two to three generations are produced annually, with only occasional pupation and emergence taking place in the fall. Some larvae hibernate for two winters. In other areas of Europe, variations in the biology as reported by Ossiannilsson have been recorded. Three generations a year are recorded in England, Germany and Italy; and pupation was recorded in the plant gall in Germany, which may be partially true in the earlier generations. In Poland, oviposition continued for about 2 months, and 2-28 eggs were laid per pod. Larvae hatched in 3-5 days, fed for 11-12 days in the pods and then entered the soil, where they completed development and gave rise to adults 11-18 days later. Pupation is said to take place 3-4 days after entering the soil in Italy.

Description: ADULT - Typical of the genus Contarinia, being dirty yellow in color. LARVA - Glossy yellow and breast bone or spatula distinctly bilobed. Detailed figures of all stages are illustrated below. (Prepared in Survey and Detection Operations in cooperation with other ARS agencies). CEIR 11(9) 3-3-61.



Figures of Contarinia medicaginis: A - Adult male. B - Antennal segment of male. C - Antennal segment of female. D - Mature larva showing sternal spatula.

Major references: 1 Barnes, H. F. 1946. Gall Midges of Economic Importance. Vol. II. 160 pp., London. 2. Blattny, C., Kac, A. and Hoffer, A. 1948. Ochr. Rost. 19-20;40-46. 3. Juchnowicz, I. and Romankow, W. 1958. Bul. Ent. Pologne 28:35-58. 4. Ossiannilsson, F. 1937. Statens Vaxtskyddsanstalt Medd. 3(20): 1-43; illus.

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